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NOTE.—Communications relative to the editorial management should be addressed to Mr. ROTHWELL. Articles written by Mr. Raymond will be signed thus * Those written by Mr. Van Wagenen will be signed ‡.

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"THE ENGINEERING AND MINING JOURNAL" ADVOCATES THE ADOPTION OF THE METRIC SYSTEM OF WEIGHTS AND MEASURES,

and urges all who are interested in the simplification of our present complicated and unsatisfactory systems to aid, by their active sympathy and encouragement, the early introduction of this much needed reform.

WESTERN OFFICE OF THE ENGINEERING AND MINING JOURNAL—DENVER, COLO.

The Western office of the ENGINEERING AND MINING JOURNAL, at Denver, Colorado, is under the charge of T. F. VAN WAGENEN, Esq., as Staff Correspondent, and W. W. ROSE, Jr., Esq., as Manager. These gentlemen are the fully accredited agents of this JOURNAL for the Western Department, extending from the Mississippi to the Pacific, and are authorized to make contracts for advertising, take subscriptions, and collect and receipt for the same.

All business communications from the Western Department should be addressed to the Western Office at Denver.

AMERICAN INSTITUTE OF MINING ENGINEERS.

OFFICIAL BULLETIN.

The Sixth Annual Meeting of the Institute will be held in Wilkes-Barre, Pa., beginning Tuesday evening, May 22, at 8 o'clock.

In addition to the regular sessions for the reading and discussion of papers, the Local Committee has arranged for visits to the mines and works in the vicinity of Wilkes-Barre, including the wire rope works of the Hazard Manufacturing Company, General OLIVER'S powder mill, the Lehigh and Susquehanna planes, etc. It is also proposed to visit the steel and iron works at Scranton.

Members will assemble at the Wyoming Valley Hotel. Railroad accommodations will be announced next week.

EASTON, PA., May 1, 1877. THOMAS M. DROWN, Secretary.

THE COLORADO STOCK EXCHANGE.

CORRECTION.

In our issue of April 21st an unintentional error occurred in an editorial entitled "The Colorado Stock Exchange." It was stated therein that Mr. Moses Anker was President of the Colorado Stock Exchange at the time of its disruption. On investigation among the ruins of the concern we find that Mr. A. B. Robbins was the President, who disclaims any connection with the circular referred to in our editorial. ‡

THE INSTITUTE AND THE "IRON AGE."

The *Iron Age* of May 3 reprints in full our article of April 28 on the Rules of the American Institute of Mining Engineers. This act of fairness atones for what we deem the injustice of its editorial comments. We should have been glad to pursue a similar course; but the articles of the *Iron Age* have been too long for our columns. We have attempted to meet its suggestions and arguments fairly; and its charge that we have "garbled" them needs proof, upon the presentation of which we shall be happy to make correction of any erroneous statement.

The *Iron Age* takes pains to repeat that the business interests of this journal are at stake, in the question of the method of publication adopted by the Institute, and to represent itself as not desiring any "patronage," but only, in the interest of the public and the Institute itself, a better system than that which is now in force. We may remind the *Iron Age* that its conversion to this elevated view dates from the time when its own proposition to assume the exact position which the ENGINEERING AND MINING JOURNAL now occupies was rejected by the Council. But we are not concerned to pursue our agile contemporary through its numerous changes of position.

Nor do we need to expose again the puerile falsehood that the Institute is managed, in whole or in part, directly or indirectly, in the interest of this JOURNAL. As a matter of fact, the ENGINEERING AND MINING JOURNAL suffers from its connection with the Institute a direct and demonstrable pecuniary loss, offset only by the honor and pleasure of co-operation in a good work. Its proprietors have repeatedly intimated to the Council their willingness to terminate the present arrangement; and they hereby give notice to the members and associates of the Institute (the only parties concerned) that, if at any time another journal, or another method of publication, should seem preferable, no considerations of favor, and no express or implied contract with this journal, need interfere with the change. We will not ask a week's notice. On the contrary, we will welcome any measure which promises to further the interests of the Institute. The *Iron Age* may renew its former proposition, if it can change ground in time, without fear that any "business interests" of ours will oppose it. If it fails again, it will be for the same reason as before, that it is not considered as suitable a medium for publication as the ENGINEERING AND MINING JOURNAL.

We are ready to listen to any suggestions, even from outsiders, for improving the Rules of the Institute; and this is the reason that we pay attention to the arguments of the *Iron Age*. We have sincerely tried to find out precisely what it proposes, but its propositions have been so hasty and ill-considered, and it withdraws them so soon after making them, that we find it difficult to extract from the mass of contradictions and retractations anything which will stand up long enough to be discussed.

In our last article we quoted the rules of the British Iron and Steel Institute toshow that they are, as concerns the reading and copyright of papers, precisely those of the American Institute of Mining Engineers, only stricter in form. The *Iron Age*, without consulting the rules of the British Institute, had offered them as a substitute for those which it condemned. To our exposure of its blunder it makes no reply, but charges us with "assuming" that the policy of the two societies is the same. What we did was to *prove* that the rule is the same, and point out the precise difference in the policy, namely, that the papers are in one case printed *before*, and in the other case *after*, the meetings.

The *Iron Age* has repeatedly asserted that the circulation of the ENGINEERING AND MINING JOURNAL is so small that the papers printed in it do not reach the public for which they are intended. *Now* it argues that the printing of papers in the JOURNAL prevents their publication elsewhere, because of the circulation of the JOURNAL to subscribers outside of the membership of the Institute. We respectfully suggest that the *Iron Age* should drop one or the other argument. Let it make up its mind whether our circulation is too large or too small to suit its views. This it can easily do, without reference to the facts. That would naturally come afterwards.

The approaching annual meeting of the Institute at Wilkes-Barre will give opportunity, if any be desired, for discussing the whole subject. The "great many" members who are "tired" of the present system may then open in concert, whether the performance be solo, duet, or chorus. The awful abuses and dismal perils which, extending beyond the bounds of the Institute, have affrighted even the distant *Iron Age*, can be fully exposed. We trust that somebody will make definite propositions, and adhere to them long enough to get them discussed. Thus far there seem to be but three alternatives suggested.

The first is the former proposition of the *Iron Age:* to continue the present system, and put the *Iron Age* in the place of the ENGINEERING AND MINING JOURNAL. To that we shall make no objection beyond the expression of our (very natural) opinion that the ENGINEERING AND MINING JOURNAL is the most suitable medium of publication. Every other claim, if any be found to exist, we explicitly repudiate.

The second is the later suggestion of the *Iron Age* that the Institute shall adopt the rules and methods of the Iron and Steel Institute of Great Britain. There being now no difference in the rules, this plan contemplates two changes: the publication of papers in separate form; and their publication before the meetings. We have already pronounced the second feature to be impracticable for a society the members of which are so widely scattered. Moreover, it has been found in other societies to be less favorable to vitality and interest than the method adopted in the Institute. As to the publication in separate form, if it took place after the meetings, it would scarcely remove the objections urged against the present system. Moreover, it would not be worth while to publish the papers in that way without the discussions. The proposition amounts, therefore, to abandoning half the present system, and leaving the volume of Transactions—only, issuing the latter three times a year instead of once. We need not inform members acquainted with the difficulties of the case that this would involve increased delay. The whole volume containing the Transactions of a single meeting would have to wait until the last paper had been prepared for the press, or else the publication would be irregular and incomplete. And how "tired" the *Iron Age* would become!

The third alternative is the suggestion of the *Iron Age* that authors should be free to publish their papers wherever they choose, in addition to and in precedence of their publication in the columns of a selected journal. In other words, since (according to the *Iron Age*) respectable newspapers will not print

such papers after their official publication in a special journal, they shall be allowed to take their pick, and the "official" journal shall be obliged to publish "second-hand." Individually, we are heartily in favor of this proposition, provided it be combined with the first above named. As the *Iron Age* originated both, it ought not to object if both are accepted. Let the *Iron Age* be bound to print for nothing all the papers of the Institute, and furnish copies at a reduced price to all members and associates; and let all the authors who prefer the ENGINEERING AND MINING JOURNAL send their papers first to us. That would suit us exactly, so far as "business interests" are concerned. But we do not think it would suit the members or advance the interests of the Institute. And we even doubt (such is the mutability of earthly affairs!) whether it would suit the *Iron Age*.

If our contemporary has any further changes to suggest, whether consistent or inconsistent with the foregoing, we shall examine them with an earnest desire to discover what value there may be in them. Its imputations upon the motives of the proprietors of the ENGINEERING AND MINING JOURNAL, and its silly talk about "the gentleman with the asterisk," we can afford to disregard.

ROSITA.

Last June, owing to the sudden and unprecedented decline in the value of silver bullion, Rosita, as a mining camp, became for a time almost deserted. Having at that time no reduction works of its own, nothing could be mined except such material as would stand the heavy cost of shipment to Denver, as well as the great depreciation in the price of silver. As a consequence all the small mines were closed, and on the larger ones the working force was cut down to a minimum. These were dark days for the new town on the crest of the Greenhorn Range, and the experience of the few months when labor was not in demand and cash nowhere to be found called forth all the patience of the few who were thoroughly enough convinced of the genuine value of the mines to stay and wait for the reaction.

Early in the fall the change came, and from that day the town has been advancing steadily. One by one the mines have reopened, until now Rositer presents all the features of a live, active camp, with a future based upon a surer foundation than before, and with enough experience in dull times to check any disposition to an immediate overestimation of its strength in the future.

The great silver vein of the camp is now under active operations for about 3,000 feet of its length. In many respects this lode is unique. It has a dip of about 30° to the west, and as yet has only been worked and explored upon its hanging wall, which, in the Pocahontas and Humboldt claims, has carried a remarkably regular and uniform seam of ore. We believe the foot wall of the fissure has never been searched for or found. A depth of between 300 and 400 feet has been attained, and in both the mines mentioned the shafts are going down steadily. The vein is so straight and regular that in the Pocahontas workings candles placed against the hanging wall at the extreme ends of one of the main levels do not show any appreciable curve in their alignment for a distance of nine hundred feet. On the lowest parts of the vein the wall is still found as perfect, being almost everywhere as smooth and even as if cut by masons.

The Pocahontas is now yielding about 6 tons daily, but is in shape to produce from 30 to 50 tons. Last fall it was determined by the owners to sink a perpendicular shaft, and a point was selected to the west and down the hillside where work was immediately begun. This shaft is now 180 feet in depth. The last drift from it cut the vein 380 feet below its outcrop, and it is calculated that, if the dip of the lode remains uniform below, it will be intersected about 800 feet below the surface. The company has just put up fine hoisting and pumping machinery, and as soon as these are in working order a heavy force of men will be put to work at the stopes and the yield raised to at least 20 tons daily.

The Humboldt shaft is down nearly 400 feet, and in the drifts run plenty of good ore is reported as displayed. This mine has been yielding steadily since its opening. It adjoins the Pocahontas, and presents the same general features, excepting that considerable water is found, while the Pocahontas is completely dry from end to end.

Of the other mines of the district mention will be made in a future article.

The ores mined on the Pocahontas and Humboldt vein range in value from 20 to 175 ounces in silver per ton, and carry from one-half to ten per cent. of copper. The mineral vein is from two inches to three feet in width, and shows generally a streak of rich ore which is easily separated by hand sorting. Three classes are made, the poorest of which, varying from 20 to 40 ounces, is at present being stacked. The second grade, which runs up to 70 ounces, is milled in the town; and the highest, shipped to smelting works in the northern part of the State.

Rosita has two reduction works; one, that of E. J. MALLETT, being a leaching establishment; and the other, known as the Pennsylvania Works, which is just going into operation, being arranged for both leaching and precipitation, and leaching and amalgamation. A full description of these will be found in a succeeding article. ‡

NEW MEXICO MINES.

The time is rapidly approaching when New Mexico mines will attract no small amount of attention. All who have visited that distant territory unite in representing its mineral wealth as great as that of any part of the West. Evidences have been found in many places of ancient mining works, showing that the people whose remains in the shape of ruined towns, acequias, fortifications, and burial mounds are so plentiful also possessed some rude ideas of mines, and probably worked many of the copper and lead deposits now known, as well as washed in the gulches for gold. New Mexico was in fact known as a mineral country long before the discovery of gold in California, and it was by Mexican half-breeds from the Cimarron Range and Santa Fe that gold was first found in the bed of Cherry Creek, Colorado.

With the building of the Atchison, Topeka & Santa Fe R. R. to Pueblo, and the extension of the Rio Grande R. R. across the Raton Pass towards Santa Fe, a new era has opened for the Territory. The vigor displayed in the rapid building of these lines has undoubtedly been due in a great measure to the sudden growth of the San Juan mines which lie just north of the border of New Mexico. But already their influence has been felt even in the most remote camps of Southwestern New Mexico.

The production of the mines of this Territory has been as yet very light. The gold and silver shipments have never exceeded $500,000 annually, and until within the last five years no copper or lead was produced. The exports of base metal at present reach about $300,000, and are increasing steadily, with the continued development of the Clifton and Santa Rita copper mines. Up to 1870 little or no silver bullion was produced, mining having been confined almost wholly to gold washing. With the opening of the Silver City district in Grant County, New Mexico entered the list of silver-producing districts, and has year by year since then increased her output of that metal, till now the exports of silver equal, if they do not exceed, that of gold.

The cause of the slow growth of the Territory is to be found mainly in the natural indolence of its inhabitants, of whom the great majority are half-breeds, content to do nothing except such as may be necessary to earn their daily bread. Up to the present time it has also been the most inaccessible portion of the Union, only approachable by hundred of miles of staging over alkaline plains, and across burning, sandy deserts. Notwithstanding, the Territory has advanced slowly in the development of its mines, and now as railroads are approaching its borders is showing many indications of a vigorous future. Prospectors are moving across the line from San Juan and exploring both slopes of the main range to the southward; inquiries are being made regarding the immense dry placers known to exist in the Rio Grande Valley and its tributaries, and in the already opened mining districts a renewed activity is reported as a consequence of the prospect of railroad communications with the rest of the world.

The principal mining districts of New Mexico are the Moreno (quartz and placer) in the Cimarron Range, the Pinos Altos in the southwestern corner of the Territory (gold quartz), and the Old and New Placer Mountains. Of these the first two are at present the most developed. The second includes the Santa Rita and Clifton copper mines and the lively camps of Silver City and Georgetown.

The Moreno mines have been at times developed with great vigor and energy, and have yielded excellent returns. The ores found are pyritous, decomposed at the surface, and of the class known as refractory, that is, not capable of being saved except by smelting. On that account as soon as the free surface quartz was exhausted the district languished, and cannot be expected to revive permanently until supplied with proper reduction works. Meanwhile, the placer grounds of the Cimarron and Moreno rivers are being worked with success; and will in the near future attract enough attention to draw capital to the camp, which in every way is worthy of careful examination.

Pinos Altos district, embracing the silver mines of Silver City and Georgetown, the copper mines of Clifton and Santa Rita, and the gold veins of Pinos Altos, is at present the most prosperous district in New Mexico. The silver mines are in limestone, and have yielded and are yielding handsomely. The copper mines are among the finest to be found anywhere, and are producing steadily. The gold lodes as yet are under a cloud. At the surface they yielded their treasure freely as usual, but as soon as the zone of decomposition was passed and pyrites was reached the camp received a check, owing to the remoteness of its position and the large capital required for the beneficiation of its ores, from which it has not yet recovered.

The placer grounds lying at various points in the valley of the Rio Grande, and in the ranges bordering it on either side, are among the most extensive in the West. Millions of acres of upland slopes are known to be auriferous to a high degree, and before the Territory came into the possession of the United States these and the gulches adjacent were worked in rude ways by Mexicans and made to pay. The great disadvantage of the locality is the lack of water, but this trouble, surveys have shown, can be overcome.

With a railroad once across its northern line and into the valley of Rio Grande a new life will come to this much neglected Territory. With mines as rich as those to be found anywhere, and hundreds of miles of deep placers scarcely touched, it presents a most inviting field for exploration and unusual attractions for careful investment. It is to be hoped that the new southern road, the Atchison, Topeka & Santa Fe, will before long push its main line still farther southward, and open it to the world. ‡

THE BALTIMORE & OHIO RAILROAD AND THE COAL TRADE.

The war between the Baltimore & Ohio Railroad and the Chesapeake & Ohio Canal has not been unproductive of good results, for probably it alone has saved the Cumberland coal trade from that paralysis which has prostrated the mining interests on the main line of the Baltimore & Ohio Railroad in West

Virginia, and has almost destroyed every industrial enterprise that has had the misfortune to be dependent solely on that road for an outlet to market. But the latter phases of this war have also been of use in showing in a very clear light the utter blindness of the policy governing Maryland's great railroad.

Mr. GARRETT, the President of the Baltimore & Ohio Railroad Company, after a delay of more than a month, answers Mr. GORMAN, President of the Chesapeake & Ohio Canal, at great length, and evidently more with the object of defending his company against anticipated adverse legislation by the State of Maryland which his oppressive policy and the political influence of his opponents seem to make probable, than with any direct bearing upon the origin of the war. This, the readers of the ENGINEERING AND MINING JOURNAL will remember, was occasioned by the Baltimore & Ohio Company allowing secret drawbacks on freights from the Cumberland region, to favored parties, or to those who would agree to transfer their entire business from the canal to the railroad. This pettifogging policy took the place of what should have been a broad, liberal one, recognizing the condition and needs of the coal trade, and treating all its members with liberality and impartiality.

Mr. GARRETT seems particularly desirous of convincing the citizens of Baltimore that the Baltimore & Ohio Company is the champion of the city interests, and that any reduction of tolls by the canal to a point below that which it pleases the Baltimore & Ohio Railroad to exact is to be treated as a blow aimed directly at Baltimore. As a special grievance Mr. GARRETT complains that the Chesapeake & Ohio Canal Company, by reducing its tolls to 46 cents from Cumberland to Georgetown (184 miles), has drawn away tonnage from the railroad that keeps up high rates. And this offense is still further aggravated by the fact that the Canal Company is entitled by law to charge 69·92 cents, or, as Mr. GARRETT puts it, "the legal toll [meaning, we presume, the maximum toll allowed by law] on coal is ⅜ cent per ton per mile, or 69·92 cents for the whole distance of 184 miles," or the rates charged are "23·92 cents under the *legal* rate." Nothing could possibly better express the policy of the Baltimore & Ohio Railroad than this expression. Evidently this "legal rate," the rate below which Mr. GARRETT considers it is improper to go, is the *maximum allowed by law*. The State has consequently every interest in seeing that this "legal" limit is not put so high as to be oppressive to the citizens, for whatever it may be it will be exacted, except in cases where outside competition absolutely forces its reduction.

It is quite true the more liberal policy of the Chesapeake & Ohio Canal has increased its business, while that of the Baltimore & Ohio Railroad was diminishing; but the Chesapeake & Ohio Railroad to the south, and the Pennsylvania Railroad to the north of it, whose coals are much less advantageously situated, have also enormously increased their coal business under the same liberal policy, while that of the fossiliferous Baltimore & Ohio has been declining. Has it never occurred to Mr. GARRETT that it is his illiberal, obstructive policy that decreased the coal business of his road nearly 40 per cent. in three years, while that of the Chesapeake & Ohio Railroad increased 71 pe cent. in two years, and that of the Pennsylvania Railroad from the Clearfield region increased 100 per cent. in three years? And does it not occur to the intelligent citizens of Maryland, and of the city of Baltimore in particular, that it is having its coal business ruined by a "peanut policy" that seems totally incapable of comprehending the plainest essentials of commercial prosperity, and the conditions of the coal trade in particular?

What can possibly better illustrate the effects on Baltimore of this management than the following statement which Mr. GARRETT, with the most astounding simplicity, gives as the result of his policy? To appreciate fully this remarkable admission, we must remember that, as already stated, the bituminous coal business of the Pennsylvania Railroad and of the Chesapeake and Ohio Railroad *increased* enormously during the same three years.

Mr. GARRETT says:

"Will the State of Maryland use its authority to crush or injure so vital and important an interest as the Baltimore and Ohio Railroad is to its chief city and to all the vast interests that are connected with it? Look at the effects of the coal trade alone upon the trade of Baltimore. Take the decrease as shown between 1873 and 1876—674,654 tons—and you represent a trade which would require 1,350 vessels of 500 tons each at the port of Baltimore to transport this coal to the points of consumption in the East and the North. What do 1,350 vessels, added to our commerce for the coal trade, mean to this community—to the taxpayers and the citizens of Baltimore? They mean the vast expenditure that traffic requires in connection with its transportation; a million of dollars in freight to the Baltimore & Ohio Company, largely distributed for labor and materials among our people, the expenditures of every vessel that enters our port for supplies and labor, and the various charges connected with its transactions. They mean also the large business in inward cargoes that would be brought to the port of Baltimore for consumption, for commerce, and transportation by those 1,350 vessels. The Baltimore & Ohio Company has been compelled, on account of the diminution chiefly of this coal trade, to reduce by thousands its skilled and valued workmen from its shops at Mount Clare and the works at Locust Point, and shops upon its lines, and of those engaged in the transportation service. It will be compelled, unless it can regain and maintain this trade, to reduce further and largely in its forces at Cumberland, at Baltimore, and in all the counties throughout its lines."

After this fatal statement of what Baltimore has lost by his policy, Mr. GARRETT, with an amazing degree of candor, or assurance, or sarcasm, proposes the following conundrum: "Under these circumstances, what is the interest of the State of Maryland?" And the intelligent citizens of the State, not to say the stockholders of the railroad company, will surely have no difficulty in solving it.

After the above exhibit of the manner in which the Baltimore and Ohio Railroad promotes the welfare of the city of Baltimore, we are prepared for the following modest claim which Mr. GARRETT makes:

"This great railway has been, from the day of its origin to this hour, a faithful, vigilant, vigorous, and invaluable assistant to the progress and development of the interests of the city of Baltimore and of the State of Maryland, and of every portion of the State with which it is connected, and all which have so prospered through the prosecution of its enterprises."

Who, that has traveled over this road from Baltimore to Parkersburg, through a country eminently adapted by its natural advantages of climate, minerals, water-power, etc., to become a fruituful hive of manufacturing industry, has not been surprised to find it almost a wilderness—an almost total absence of factories? No furnaces and iron works, such as we find scattered along the line of the Pennsylvania Railroad; its coal mines closed or mining merely to supply a local trade; its coal lands unsought at prices far below those willingly paid for inferior lands on the line of the Pennsylvania Railroad. If we inquire the cause of this desolation—the reason why capital avoids investment in this region of wonderful natural advantages—we learn that it has been the practice of the enlightened management of the Baltimore & Ohio Railroad to make such exorbitantly high freights from points on its own line that have not the advantages of any other outlet, that no industry can thrive there. It is no mere rumor but a demonstrable fact that Cumberland merchants have sometimes found it less expensive to have their consignments of pork from Cincinnati sent past Cumberland to Baltimore, reshipped to Georgetown, and then sent up the canal to Cumberland, because that station has no competing road. This single example illustrates the policy of this company as well as would a dozen that might be mentioned.

Mr. GARRETT seeks to interpose the public interest in the Johns Hopkins University between the growing indignation of the citizens of Maryland and his company by stating that the University has its chief foundation and support in the stock of the Baltimore & Ohio Railroad. We regret exceedingly to learn that this promising institution is depending for its support on so precarious a foundation, and it seems to us to be the urgent and plain duty of the Trustees of the University to transfer to some more safe and permanent security the funds on which so much depends.

Mr. GARRETT seems to be greatly distressed over the injury which the enforced reduction of one cent per ton per mile in tolls on the Cumberland & Pennsylvania Railroad has done to New York capital, and says:

"A large capital was invested where it was much needed in developing the interests of the mineral region of Western Maryland by citizens chiefly of New York. They built a costly railway through a difficult country, with high grades and severe curves. The same parties also invested in coal properties in that region, and changed what was comparatively a wilderness to a region full of industrial progress. During many years this company failed to make any dividends, and never made more than four or five per cent. At the period of this legislation the stock of the Consolidation Company, which owned this railroad, was selling at about 50 per cent. of its par value. What has been the result of that legislation? That stock has decreased to 25 per cent. of its par value, and its owners in other States became greatly dissatisfied and alarmed at the action of the Legislature of Maryland, which, they believed, would make their investments and property unremunerative and comparatively valueless."

When Mr. GARRETT says that the Cumberland and Pennsylvania Railroad failed during many years to make any dividend, and that it never earned more than four or five per cent., he conveys a false impression, for it is well known that the net earnings of the Cumberland & Pennsylvania Railroad amounted to from thirty to forty per cent. on its capital of $1,500,000, and even within the past ten days some of this stock was bought in this city at $120, or 20 per cent. premium, and the price asked for other lots was $150. And this notwithstanding the reduction in tolls required by the recent Maryland legislation, and the depressed condition of trade. The fact is the earnings of the Cumberland & Pennsylvania Railroad have formed a kind of sinking fund to make up the losses incurred in the mining department, and to provide the four or five per cent. dividends on the highly watered ten million dollars capital stock of the Consolidation Coal Company.

It is quite true Mr. GARRETT and some of his friends who invested in Consolidation stock at near 50 per cent. of its par value, have lost some $800,000 by its decline to $25, and if he continues to hold it his losses will probably amount to much more than this. But because Mr. GARRETT ruins his own property in common with that of others, by the adoption of an insane policy, which, by refusing to meet the demands of trade in reasonable transportation charges, destroyed the goose that laid the golden eggs, he certainly cannot plead his own incapacity as a reason for the intervention of the State to preserve him from its natural and inevitable fruits. But there is much other New York capital invested in the Maryland and Virginia mines dependent on Mr. GARRETT's roads for an outlet to market, and though these investments are suffering and are all but destroyed, even their imminent danger, which threatens the income of his own road, does not seem to inspire this eminent patriot with any policy above that suitable for managing a corner grocery.

With every industry upon the line of the Baltimore and Ohio road languishing or dead, while those on the neighboring lines are reviving and growing; with a deep-seated aversion in all financial circles against making investments where they will be at the mercy of this Shylockian policy; and with the disastrous results to Baltimore, which we have given above on his own authority, we may well repeat Mr. GARRETT's question: "Under these circumstances, what is the interest of the State of Maryland?"

THE ALLOUEZ MINE AND ORE DRESSING, AS PRACTICED IN THE LAKE SUPERIOR COPPER DISTRICT.*

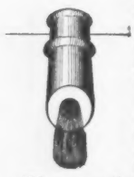
By Charles M. Rolker, E.M.

(*Continued from page 296.*)

The mode of dressing the copper is nearly alike through the whole district. The following is a description of the mode in use at the Allouez Mill: The material after being stamped by the Ball stamp runs through launders to the hydraulic separators. Here 4 different sizes of ore result; the 5th one, the slimes, are carried by launders from the separator along the sides of the building to the slime-collecting boxes. The plan has 4 hydraulic separators, each separator having 7 machines and 2 sieves, whence there are 28 machines or 56 jigs in the building. As the arrangement for each quarter division of the mill is the same, it suffices to describe a quarter section to have the mode of working of the whole mill. The plan, Fig. 16 *A*, shows the jigs with the respective numbers 10, 12, 16, 25, and again 12, 16, 20, 30, etc., marked on them. These numbers designate the fineness of the wire sieves, being $10 \times 10 = 100$ or $12 \times 12 = 144$, etc., rectangular meshes to a space 25 by 25 mm. (1 square inch). To abbreviate, I will call such sieves the 10, the 12, 16, etc., sieves. Between two sieves the letter *M* is marked, designating the machine with framework, between which the rocking levers, stems, plungers, etc., previously described, work. Two of such adjoining sieves form one machine, as shown on Fig. 18. An entire machine is 2·083 meters (6 feet 10 inches) wide, 1·068 meter (3 feet 6 inches) long, and 0·838 meter (33 inches) high on one end, and 0·965 meter (38 inches) high on the other, owing to the slant of the flooring. The jigs in the first row, reckoned horizontally, are called the "head-machines;" in the second row, the "first tail sieves," in the third row, the "finishers;" in the fourth row, the "tail-finishers;" in the fifth row, the "second tail sieves."

From the horizontal separators the ore drops through perforated stoppers, Fig. 17, on the aprons A of the respective 10, 12, 16, and 25 sieves. At this stage I will state that the final products of the Allouez mill are a No. 2, No. 3, and No. 4 copper, varying in purity and size of grain. No. 1 copper are the chunks of metallic copper pounded together in the mortar, which are collected till a barrelful is obtained—one barrel per two months. Returning to the top sieves, where the material has been received on the aprons, it runs down those on to the 10, 12, 16, and 25 sieves; here it is jigged; the lighter material goes to the top, is washed down the aprons connecting the first with the second row, or the head-machines with the first tail sieves; here it is rejigged.

Fig. 17.



What runs through the 10 sieves is No. 3 copper; it is conducted by launders at the bottom of the machines along the floor to the aprons of the 16 sieves, in the third row—the finishers. The top rock of the 10 sieves is taken off, about 1 pailful each time, and it is put back under the stamp, being very coarse; the copper below it is No. 2 copper. The sieve is cleaned about four times a shift (12 hours); $\frac{3}{4}$ of a pailful of No. 2 copper is taken from it each time and put into the copper barrels. The material running off from these 10 sieves runs to the 12 sieves of the first tail sieves, or the second row. It is rejigged here. The quantity that runs off here runs into the launders *L*, and is carried on to the beach. What runs through the 12 of the first tail sieves runs to the 16 sieves in the fourth row—the tail-finishers. It is of No. 4 grade. The quantity remaining on the 12 sieve is skimmed about 4 times per shift, taking each time about a pailful. It is put back under the stamp. The next sieve, the 12 of the head-machines, works exactly like the 10 sieve just described, and so does the 16 sieve in the second row, or the first tail sieves, work similar to the 12 sieve described of that row. The products of both are united and go to the same finishing sieve. In fact, the entire head-machines work all alike, only they run in couples of two. The products of the first two are kept together, and the products of the last two likewise. 10 and 12 form one couple, and 16 and 25 the other. The part going through the 16 and 25 sieves of the head-machines goes to the 25 sieves of the finishing machines, or third row. The part going through the 20 and 30 sieves, second row, or the first tail sieves, goes to the 30 sieve in the fourth row—the tail finishers. Sieve No. 25, head-machines or first row, is skimmed only once a week. To say briefly: The head-machines furnish the copper No. 2. The first tail sieves to the head-machines have the material on the sieve restamped. The quantity running through the sieves of the head-machines is finished in the third row, on the finishing sieves. Again, the material running through the first tail sieves is finished in the fourth row, on the tail finishers. Coming to the third row, the finishers to the head-machines, we find no rock for skimming on the 16 as well as 25 sieves of this row. On both sieves No. 3 copper is produced. The 16 sieve is skimmed 6 times per shift, and 6 pailfuls of copper are taken. The 25 sieve of this series gives only 1 pailful of copper per shift. The material running through the 16 finishing sieve is No. 3 copper; it is washed in the box marked 3, standing in front of the fourth row. What runs over the 16 finishers runs on the 16 tail finishers, fourth row, and unites with what came from 10 and 12 of the first tail sieves. What remains on the 16 tail-finishing sieves is skimmed once per shift, yielding 1 pailful of skimmings, which are brought back under the stamps again. They collect about 1 pailful of No. 4 copper per week on this sieve. That running through this sieve is No. 4 copper; it is washed in the box next to the No. 3 copper.

In a like manner the finer sieves 25 and 30, third and fourth row, work. The material running through the finishing 25 sieve is No. 4 copper, and so is also what runs through the tail-finisher 30. Both are run into wash-boxes marked 4. The No. 4 copper of the 30 sieve must still be keeved. The material accumulating on the 30 sieve is skimmed once in 12 hours, 1 pailful at the time. It is restamped. All the material running off of the tail-finishers, the 16 and 30, is run into the box S, which has the inclined sides before mentioned. The 16 enters the smaller compartment, the 30 sands the larger one. From these boxes the material runs on to the second tail sieves, the 20 and 30 respectively. What copper remains on this is No. 4 copper. The rock skimmings go back to the stamps, and the material which runs through the sieves is No. 4 copper. It runs into the boxes marked No. 4, in front of the bottom machines. Both the No. 4 copper have to be buddled and tossed to purify them a little more. The rock skimmings of the 20 sieve bottom machines amount to 1 pailful per shift; of the 30 sieves, to only ½ pailful. What runs over the bottom machines runs to the tail-house, uniting with the overflow of the box S. The product of the rotating table is buddled in the apparatus before described. The material thrown into the head-box or hopper of the buddle is drawn out and worked towards the sides. Water is admitted, and the material well shoveled through and broomed. Water is drawn off, and the material divided into 3 parts, head, middle, and tail. The tails are run back to the rotating table, the middle is rebuddled, and the heads are put into the keeve.

The work in the keeve is effected by shoveling the material into it, fill the same half with water, and letting two boys turn the handle of the axle and fan before described. After about ten minutes the whole is fully well in rotation. It is then tossed and packed with a box, the water is drawn off, and the tub skimmed with a scraper, which is an ordinary hoe with a 0.457 meter (18 inch)

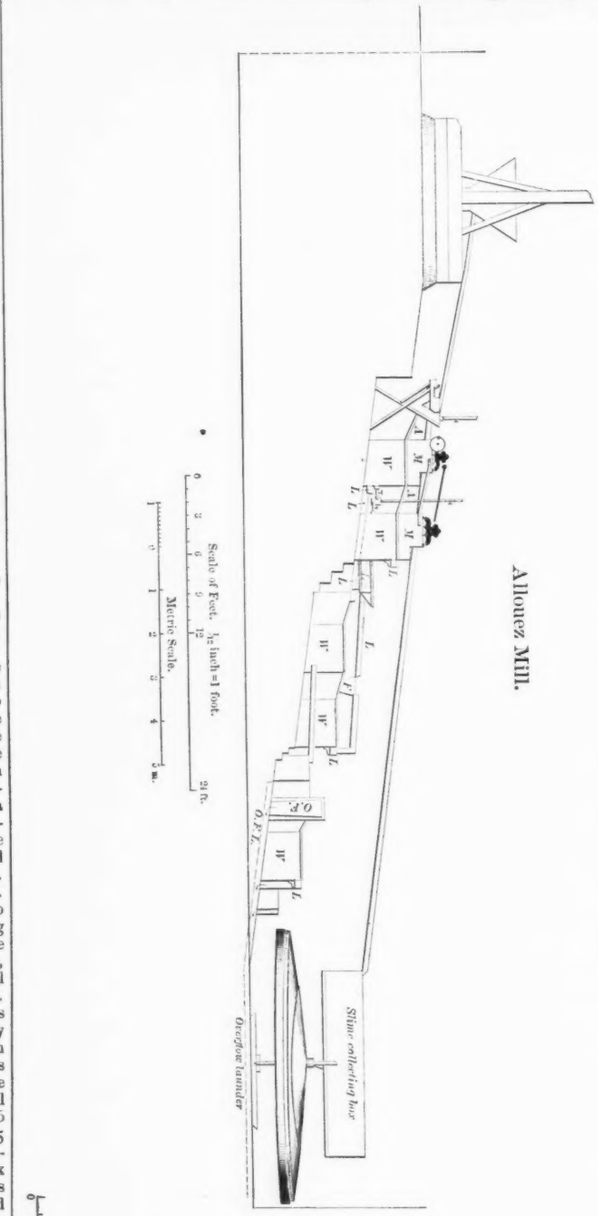


Fig. 16. *B.*

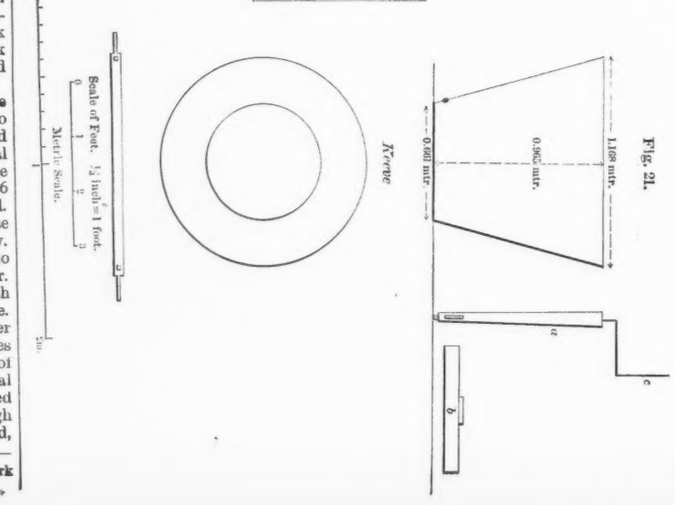


Fig. 21.

* A paper read before the American Institute of Mining Engineers, at the New York meeting, February, 1877.

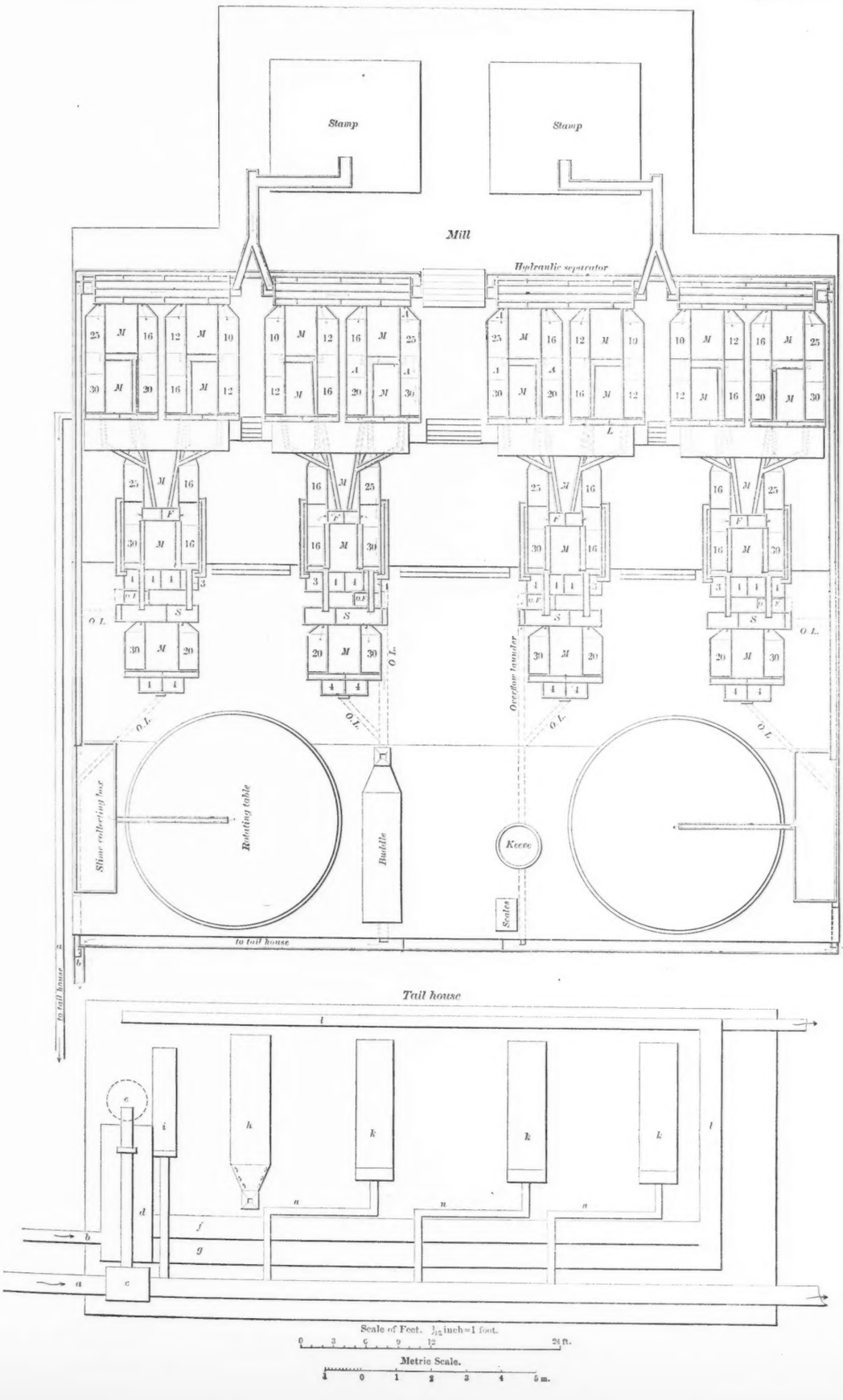
handle. The quantity is divided into three portions. The top, or the lightest, goes back to the round table, the middle is again buddled, and the bottom, the richest material, is retossed. The second top is rebuddled, the second middle is put in the keeve again, and the bottom is put into the barrels as No. 4 copper.

This is essentially the Lake Superior process for dressing. The flooring of the Allouez mill has a slant of 125 mm. per 1 meter 1½ inch to the foot). Whatever is spilt is washed together, swept, and utilized. In other mills there are separate catch boxes for this purpose in the flooring of the mill, *f. e.* Calumet & Hecla, Franklin, Atlantic, etc. At the Franklin mill the product of the rotating table, instead of being buddled and keeved, is conducted by launders to a percussion table. The table has an apron suspended over its back end; on this the material runs. The lighter rock washes below the apron on the back end of the table into a box. These slimes are re-treated on the rotating table; the richer material advances forward on the table, and is washed off into the copper box by a thin stream of water emitted from a triangular-shaped sheet iron box. The table is the common percussion table suspended on 4 iron arms, movable in the direction of the stroke. The stroke is given by 3 cams, fastened to an axle, striking on a piece of flat iron fastened below the table.

The jar of the back stroke is eased by letting the table strike a spring, coiled round a stem, similar to that in the bottom washer. This washed material is then keeved. The same table is at the Calumet & Hecla mills. The stroke in those mills is given by the elliptical gear of the Ball stamp. Such table makes 150 to 160 strokes per minute.

TO BE CONTINUED.

Allouez Mill. Fig. 16. *A.*



THE LIABILITY OF DIRECTORS.—An important legal question touching the liability of Directors in trust corporations came up recently before Judge Donohue, holding Supreme Court Chambers, on the petition of Charles K. Foote, of Mobile, Ala., and numerous other policy-holders, represented by Barnes & Hanover, in the suit of the People of the State against the Security Life Insurance and Annuity Company and William H. Wickham, Receiver. The petitioners ask the Supreme Court, in the exercise of both its legal and equitable jurisdiction, to direct and empower the Receiver to enforce by a proper action or actions the personal liability existing under the general provisions of the Revised Statutes, against the Directors of the Security Life Insurance and Annuity Company, for declaring and paying unlawful dividends of profits to both stockholders and policy-holders of the company in violation of the provisions of the charter of the company and of the said Revised Statutes. In support of the petition it is claimed that the Directors having illegally distributed to the policy-holders over $1,000,000 of the assets of the company, the court should unquestionably direct and empower the Receiver, either alone or jointly with representative stockholders and policy-holders, to prosecute an action or file a supplemental bill or petition, to enforce the Directors' liability. The State of New York, it is held, is under obligations to the other States of the Union to pursue to the utmost limit all possible legal remedies, to redress the infamous outrages inflicted on thousands of families that have recently failed in New York; that if the courts of this State fail in this respect, the confidence of the public in financial institutions in the City of New York will not be restored in half a century, and trust in business and mercantile honor will not and ought not to be given. Under the sanction of New York State charters, these corporations have entered into the inner sanctuaries of thousands of households, not only in this but in every other State in the Union, and for a series of years have reaped therein their golden harvests. Since the incorporation of the Security Company, $1,156,567 73 have been paid in dividends to policy-holders, exclusive of the dividends paid to stockholders. This question may become of practical importance to the stockholders of railroad and coal companies who have declared dividends not earned.

THE NOMENCLATURE OF IRON.*

By Henry M. Howe, A. M., M. E.

(*Concluded from page* 300.)

Discussion following the reading of Mr. H. M. Howe's paper at the February meeting of the American Institute of Mining Engineers.†

MR. R. W. RAYMOND.—It seems to me that the terms "wrought iron" and "wrought steel" could be retained instead of weld iron and weld steel, which are both new and liable to misconstruction. An evidence of this was the fact that in this debate they have already been construed to refer to the property of welding possessed by the metal. I would not undertake to decide hastily upon a point of this kind; and, if "wrought iron" does not fairly cover all that was meant by "weld iron," I would give up this view. In the discussion on this subject at the June meeting in Philadelphia it was suggested that "wrought iron" would not include blooms; but from this view I beg leave to differ. Homogeneity either means the absence of all structure, or the uniformity of appearance and structure over a single section. In the first sense it is not true of any steel, nor is it a result of fusion and cooling. In the second sense it is true of many wrought irons. The cross-section of a fibrous structure, as Dr. Adolf Schmidt has pointed out, may be homogeneous. What is meant by the Committee's preamble is the absence of fibrous structure or the presence of granular structure. Hence the preamble is defective, in defining as a characteristic of steel a property which it does not strictly possess at all, and which in the sense intended, even, not all steel possesses. I merely make this criticism by way of putting it on record, and explaining why I have taken pains to frame the resolution which I shall offer in such a way as not to indorse the preamble.

MR. WM. METCALF.—With regard to Mr. Howe's questions put to machinists and carpenters, I would say that the evidence of such men has no value whatever when it is known, as all steel makers know, that many mechanics who have been steel workers for years do not know what steel is, so far as its structure, or laws of action, or its composition is concerned, This whole discussion grew out of a mistake in the omission of a word. If Mr. Holley had said "cast" steel is "malleable iron made homogeneous by fluidity," and subsequently if I had said, in my paper before the American Society of Civil Engineers, "cast" steel "is iron which has been produced by fusion and which may be forged," this discussion probably would not have arisen. The question has three aspects: 1. The scientific; 2, the practical; 3, the commercial. I can appreciate the advantages in the proposed nomenclature, but do not admit its superiority to the one now in use, which may be tabulated as follows:

- Iron
  - Wrought
    - Puddled
      - Bloom
        - Catalan
        - Finery
      - Bars
      - Plates
      - Beams, etc.
    - Steel
      - Blister
      - German
      - Shear
      - Puddled
  - Cast
    - Not malleable
      - Pig iron
      - All ordinary castings
      - Castings—annealed and decarbonized in oxides
    - Malleable
      - Steel
        - Castings—not highly carbonized
        - Crucible
        - Bessemer, or pneumatic
        - Open hearth.
          - Or Siemens-Martin.
          - And Siemens by pig and ore process.

The above arrangement contains nothing more than the present well-understood commercial classification, except the grouping of the old steels under the generic term "wrought steels." The advantage of having a new nomenclature, which can be literally translated from one language to another, is entirely outweighed by the coinage of the adjective "weld," and by the introduction of new terms which are no improvement upon those in use and which must lead to confusion. The word "weld," as here used, is entirely new, and not as good as "welded" would have been; and the good old word "wrought," which expresses something and means what it is intended to express, is much better than either. The existing commercial classification, which I have placed upon the board for convenient reference, and not as anything I propose or anything new, is entirely satisfactory to manufacturers and consumers, and is, I claim, also scientific.

The commercial side is important. People who know what they want order steel without any confusion of ideas (not terms). They order, for instance, steel that will not harden under any conditions, which may be cupped cold by being forced through a die, and from that through all of the quantities of carbon up to 0.30 per cent., giving such a variety of conditions as to bring every possible percentage of carbon into practical use, and the steel maker meets these requirements without difficulty.

In answer to the statement that the term steel is applied to what the Committee wish to call "ingot iron," for the purpose of giving it an enhanced and fictitious value, I would ask the gentlemen to make their researches among the skilled mechanics throughout New England, and even here in New York, wherever fine work is done; for instance, at sewing machine (not mechanics) manufactories, silver-plating and nickel-plating works, etc., where steel has come into very large use. Among such people, they will find that steel is ordered expressly on account of its superiority to iron—the difference being well understood—and that they gladly pay the increased price because it is compensated for in the labor required to secure a fine finish, and again in the enhanced value of their wares. The fact is, that in the last fifteen years this branch of the steel manufacture has grown to such an extent that a very large percentage, probably half the weight of all that is produced, is of this very mild steel; and it is not known that any one ever confused it with wrought iron or was deceived as to its value.

The object of my paper last fall was to show that this commercial classification was not unscientific, and that it was perfectly clear and allowed no room for law suits. The classification of the International Committee introduces new terms, and with these terms confusion, which will open the door for all sorts of legal disputes, and as a scientific nomenclature it is no better than that which we have.

I agree with Mr. Raymond in his criticism of the word homogeneous so far as it meant to convey an impression of absolute homogeneity, for we can find a great variety of structure in the same bar of steel; but so far as it conveys the idea of such homogeneity of structure and of composition as are due to fusion it is correct. I would ask Mr. Raymond to insert in his resolution that the ingot steel and ingot iron of the new nomenclature are equivalent to what is now known as cast steel, including the so-called low steels, this being important commercially, because it is simply impossible to draw an arbitrary line between steels which will harden and steels which will not harden. Iron and steel cannot be separated by the property of hardening, for hardening depends on many conditions, the amount of carbon being only one. The size of the piece, the temperature to which the bar is raised, the temperature and conducting power of the cooling medium, and many other circumstances influence the hardening. It being understood that the nomenclature on the board *is the correct existing commercial nomenclature*, and is so recognized by the Institute, there is no objection to the amended resolution, as it gives opportunity to those who wish to write in terms which shall be the same as those that are now adopted in Europe; and with this understanding I shall not oppose the use of the terms ingot iron and ingot steel for literary purposes. I have no authority to speak for the International Committee, and had intended to take no part in this discussion. I do so only because I think the work of the committee is not thoroughly understood. It would not have been possible to make any report against which there would not have been objections. Our profession makes, as a general thing, conservative men, and the first objection that would naturally arise to any proposed classification would be that it is new. The object of the Committee was to present a classification which would be based upon some recognized principle, and which would not do away with any of the old terms with which we have been so long familiar, but which would classify them in some such way as, while retaining their use, to show exactly what their relative meanings were, and thus prevent the confusion which now prevails. It was the intention at the outset not to introduce any new terms at all, and it may be said that this has been carried out, except so far as the English language is concerned. It is very remarkable that the words which have been selected can be exactly translated into three different languages, and that no serious objection has been urged to any of them except in this country. They have been accepted, almost without criticism, in Europe, and, what is most remarkable, in Germany, where there has been up to now such a multitude of terms in use. I could have wished that the English terms had been a little more English. The terms *weld iron* and *weld steel*, though they express the idea perfectly, sound strangely to Anglo-Saxon ears, while their equivalent terms are perfectly satisfactory, and have already been accepted. Personally, I should much rather prefer some other adjective to "weld" as applied to iron and steel, for, while it is thoroughly Saxon, it is not Anglo-Saxon. I think it possible that some other term might be found that would express the idea of the mode of manufacture as this does and at the same time be more English. The objection to the term as it now stands, is one of usage, which, if it is adopted, use will correct, but I see no objection whatever to the principle involved. It does not mean that the material so classified possesses the property of welding, for if that was the meaning it would give no proper distinction, since in the strict sense of the term even cast iron may be welded; but it means that the particles have been welded together in the process of manufacture by pressure and not welded by fusion, as is the case with cast iron, ingot iron and steel. The ambiguity of the term is not a serious objection to it, and comes only from the fact that the report of the Committee is necessarily concise. The report would have been by far too long if it had been thought necessary to go into the discussion of all the reasons which led to its adoption by the Committee. I should prefer that some other word should be found, if it is possible, but it seems to me doubtful whether any other term can be found which can be translated, and which will express the idea of the mode of manufacture as this does, and I therefore hope that the finding of another term may be referred to the committee. I should be exceedingly sorry to have an attempt made to modify the report without the most careful deliberation, and think that, if it is to be modified, the modification should be made by the same persons who presented the report. If no other word can be found which will express the idea in the three languages, I should prefer the report to remain as it is rather than to sacrifice any principle which is expressed in it. I am unable to see why the manufacturers should make any objection to the classification, since no change has been made in the definitions which involve any new principle. The terms "*cast*" iron, "*cast*" steel, and "*pig*" metal were considered to be just as objectionable at the time they were introduced as the terms proposed, and the term pig, though it has a history, is a very arbitrary selection. Long usage has made us familiar with them, but if we should undertake to criticise the accepted terms of metallurgy, what should we do with the gobs, the sows, the bears, and other similar terms that we find accepted everywhere without criticism? Usage has made us familiar with them, and usage will make us equally familiar in a much less time and with much greater reason with the terms *weld iron* and *weld steel*.

The matter at stake in this discussion is the principle involved more than the terms. Iron and steel will always remain iron and steel, even though the modes of manufacture may change; but, with the progress of invention and discovery, different qualities of the material will be brought into prominence, which will give names more or less definite to the material manufactured. These will involve new considerations possibly, and when these considerations are brought forward we shall probably have to modify the names again just as they have been modified little by little in years gone by, and brought us into the confusion in which we now are. With the active research of to-day, and the necessity of reducing the cost of manufacture, new relations of the materials composing iron and steel will be given, some of which may be only trade-marks, just as to-day we have carbon, titanium, chromium, silicon, and other steels. These names will involve more or less truth, and will come to the surface and will disappear from time to time, and will simply arrange themselves in their proper places under the new classification, but that will not affect it. It has been recently discovered that phosphorus and silicon have a most unexpected influence in preventing the solubility of cast iron, so that recent investigations seem to show that, if we can only get certain proportions of phosphorus and certain proportions of silicon in the iron, and be able to cast it thin enough, we may be able to dissolve gold and platinum in vessels of this character. The development of such a manufacture may lead to some other important discoveries, and the product may receive a name which will be current, but it will not necessitate any such change in the classification. Much has been said in regard to retaining the term of *cast steel*, which 20 years ago was a very precise term, but has become so ambiguous that we require already the use of another adjective, as, "crucible" cast steel, in order to define it. It is not the intention to do away even with this

* A paper read before the American Institute of Mining Engineers, at the New York meeting, February 28, 1877, in opening the discussion on the motion to adopt the report of the International Committee on the Nomenclature of Iron and Steel.

† In publishing the account of the animated discussion which followed the reading of Mr. Howe's paper, it has been thought best to record only the points of the discussion which bear directly on the subject, and the members participating have been requested to write out their remarks, based on notes provided them by the Secretary and taken down by him during the discussion. In this way the report is freed from all extraneous matter, and the views of the speakers appear concisely and forcibly, which will more than compensate, it is believed, for the absence of the strict sequence in the debate.

The resolutions adopted at the close of the debate have already been published in the ENGINEERING AND MINING JOURNAL of March 10, 1877. T. M. DROWN, Secretary.

term for commercial purposes, but it does not seem to me at all improbable that 20 years hence we shall neither have the term *cast steel* nor even *carbon steel* in use, but that we may possibly find that other substances combining in certain proportions with iron will produce a material which will have the properties of steel, and yet not be steel, according to our present ideas. I must agree with Mr. Howe that, from the time of Tubal Cain down, hardening and tempering have been characteristic properties of steel, and it has not been forgotten in the report, but it would have been unwise to have taken these properties only as a distinguishing feature of the commercial compound of carbon. It must be remembered that the report of the Committee was a compromise, but it was of such a nature that no principle was sacrificed in making it, which is, I think, the reason why the very acute and very critical German minds have adopted it. It was adopted by the Committee more to have a common language in technical discussion which would make the research of one country available in another, and do away with the ambiguity of the terms now in use rather than for commercial purposes; but while the report is fully adapted for scientific discussion, it seems to me equally well adapted to settle the vexed questions which are constantly arising in commercial transactions, and has, besides, the very great merit of being susceptible of accurate definition, and capable of being applied equally well to commercial and scientific transactions. I hope, not as a member of the Committee, but as an engineer, that the report will be adopted, and that, if any changes are to be made in it, the part of the report in which change seems to be desirable shall be referred to the Committee for their consideration. The report, as a whole, has been hailed in Europe as a harbinger of peace, and familiarity with it will, I think, do away with most, if not all, of the objections raised against it.

THE SILVER SANDSTONES OF UTAH.

TO THE EDITOR: SIR—Having recently had occasion to visit Utah's El Dorado, Leeds, or the "country of the silver sandstones," perhaps a few words concerning it may not prove uninteresting. This mining region, which is at present creating not a little interest in this section of the country, is situated in the extreme southwestern corner of the Territory, some three hundred and twenty miles from Salt Lake City. The formation is a beautifully stratified red and white sandstone, but greatly broken up and eroded. Where the strata have been undisturbed they rise up to a height of perhaps a thousand feet above the adjacent valley in table mountains, alternately banded in red and white, and plainly showing the former height of the whole country.

The numerous extinct volcanoes, and the vast quantities of volcanic rock found throughout Southern Utah, and particularly this section, point to at least one agent, and no doubt a powerful one, which served to produce the numerous foldings and contortions of the strata, while the great sandy deserts covered with sage and cactus bear abundant evidence to the erosion. On the northern side of what was once a vast basin lying between several ranges of high mountains of old rock, where the erosion of an anticlinal has left ridges or reefs cropping out at various angles, are situated the mines. Most of these are as yet hardly more than prospects, but present a remarkably fair showing for the work done.

The *fact* of finding beds of sandstone impregnated with silver in sufficient quantities for working—although not so new as many suppose—is still unusual, to say the least; especially when found in such large quantities and of such value as in this case. The miners, who expect to find ore only in *veins* in the older rocks, as the granites, gneisses, and porphyries, and who some years ago were puzzled at finding it in limestone, are totally at a loss in the present case. Those who, in their ignorance, claim that it contradicts all previous theories, proceed to furnish new ones, and some indeed of the wildest description. In accordance with the too common habit of assigning the most complex reasons to account for the simplest things, they talk about infiltration and sublimation from below, *after* the formation of the rock, and *even* after the breaking up and erosion of the strata; and a correspondent of a Western mining paper of some note has nearly, if not quite, come to the conclusion that the chloride of silver has been deposited in the rock, since it was broken up, by the sublimation of vapor, which, coming from an unknown source below, penetrated through and through the pores of the sandstone and clay; and suggests that in time they may reach the source in the shape of a deposit of the pure metal. Without remarking upon such a theory, which a glance at the ore ought to dispel, I will proceed to mention a few details.

The sandstone consists of red and white deposits, carrying some lime as a cementing material, with occasional layers of clayey or shaly rock, and considerable carbon scattered throughout. This carbon, which is evidently from the decomposition of drift material, of which the impression in the rock and *even* the *plant itself* is yet distinct, occurs in important layers in places; and I am informed that small beds of coal are found not far distant. Petrifactions, even of the size of large trees, are not uncommon, some of which form a valuable ore. The white sandstone, which appears to be of a somewhat finer texture than the red, seems so far to have carried the ore, but the whole strata, including the red variety, I understand, carries more or less, and it is probable that nearly any of the rock will give traces.

The mines are merely shafts or inclines, sunk upon such beds of sandstone or clayey rock as crop out on the so-called reefs, and which prove of sufficient value to work. These veins, as they are there called, are entirely conformable with the strata, and in no case do they cut across the adjacent layers of rock. They appear to be richest where there is the most carbon, which evidently has acted as a reagent to precipitate the silver from solution and to deposit it, sometimes as flakes of native silver, in its midst. In some cases the form of the plant, of apparently a reedy nature, is yet distinct, in which the cells are yet visible, but to a great extent filled with valuable ore. Other beds carry considerable copper in the form of blue or green carbonate, and also iron in nodules which run very high in silver. These latter naturally give to it a very streaky nature, making a most careful sampling an absolute necessity. A light sandstone containing streaks or fine layers of a dark material, which elsewhere would not attract attention, is there found sometimes to run from $50 to $100 a ton, while the darker rock, containing considerable carbon, copper, or iron nodules, will at times run far into the hundreds or even thousands.

The dark ore goes by the name of a black sulphide or carbonate among the miners, but is probably only a chloride of silver mixed with free carbon.

There seems scarcely room for doubt that the *deposition of the ore was perfectly contemporaneous with the formation of the sandstone strata in which it lies; or that it was precipitated as chloride* and *native silver*, AT AND DURING *the time that the beds of sand were* BEING DEPOSITED, BEFORE *it became* ROCK, and while they were *yet in a horizontal* or *nearly horizontal* POSITION. Everything points so strongly to this conclusion that it seems almost impossible to think otherwise. That the whole basin was once an inland sea or estuary, whose bottom was hundreds of feet above the present valley and probably at or nearly on a level with the neighboring sandstone table mountains, seems evident; and that at times the land arose above water level, or was subjected to different currents bringing material for the different strata, as shown by their variety, and between whose deposition considerable time *may* have elapsed, seems probable; while during the formation, at certain times more than others, silver in the solution must have mingled in the waters and been precipitated among the layers and laminæ of the sand and clay, and in great quantities where there was the most vegetable mold, carbon, and iron. The source of these mineral waters may have been springs or rivulets from the higher land at the sides of the basin, which, in their course through the mountains, have taken silver into solution only to have it again precipitated on reaching the lower levels and meeting with brine; and it is not improbable that upon exploration large silver-bearing *veins* may be found in the older and higher land of the vicinity.

Since that period the strata have been folded, bent, and broken by volcanic action or the contraction of the earth's crust, and the upper portions washed away, leaving no places but the two sides of an anticlinal cropping out in reefs, with opposite dips, several miles apart. Between these are sometimes found small mountains of volcanic reef, which in places has overflowed and is found capping the sandstone. Here, as well as far to the north, vast overflows of such material have taken place, covering rock of a comparatively recent date, and seeming almost too extensive to be the outpouring of volcanoes alone.

At present the mines are confined to three nearly parallel sandstone reefs cropping out in the little Mormon village of Leeds and the neighboring camp of Silver Reef, and to several similar reefs of probably the same or nearly the same strata which are found dipping in an opposite direction several miles to the south, near the banks of the Rio Vergin. Some of the lower portions of this anticlinal are still seen intact a little further down, while the same red reef, apparently, is found overlying the white ones. These reefs can be traced for ten or twenty miles to the southwest, cropping out at intervals along the surface, but as yet have been but little prospected. From the nature of the ore and the manner of its occurrence and deposition it is almost safe to conclude that it extends throughout the whole basin for many miles around, and can or will be found wherever these same reefs crop out (which they probably do to the south and west), or wherever these strata may be struck, either by sinking on the synclinals or prospecting on the sides of the neighboring table mountains.

That in all places these strata will be equally rich is not cerain, but the chances of considerable uniformity are good, while it is more than likely that other beds than those already found will be struck that may prove as rich or even richer than the present ones.

From the circumstances one would deduce that, having once got below the water level, the character of the ore would remain pretty much the same, and perhaps be somewhat richer than near the surface, where it may have been weathered and some of the ore have been dissolved out and found its way to lower levels, while the thickness would be tolerably constant. There seems no doubt but that in time plenty such ore as has already been found will be easily discovered. Here, as elsewhere, the Diamond Drill would be a valuable aid, And it is a matter of some surprise that as a cheap and efficient mode of prospecting it is not more extensively used throughout the West.

The ore, being a remarkably free milling one and easily crushed, can be cheaply worked; probably, with suitable mills, for ten dollars a ton.

As in every new camp, the ore is overrated by the miners, who will say and honestly believe that it will run far more than it really does; this is especially the case where the ore is a new one to them, and one which they have hardly learned yet to sort properly. Careful samplings and assays show that there is a large and apparently unlimited amount of ore running from $20 to $50 per ton, several beds, a foot or more in thickness, assaying from $50 to $200, while others have streaks of various widths from one to ten inches, yielding ore from $200 to $1,200. Some carefully sorted ore, and no inconsiderable amount at that, will run from one to five thousand per ton. These figures I deem moderate and fall far below those of the miners'. At present the low grade ores are worthless, and nothing under a hundred or hundred-and-fifty dollar ore is treated, except, perhaps, the company's own ore. Indeed, those that can, prefer to await better and cheaper milling facilities rather than pay the present charges or ship their ore to Salt Lake City or Pioche, the nearest places to market. To meet this demand several new mills are on their way in, and others are said to be preparing.

The Leeds Mining Company of San Francisco has had a mill operating there for over sixty days, which has done well. They have ten stamps, eight pans, and four settlers, with which they treat thirty tons a day, and are said to save over ninety per cent. of the assay value. They work the ore from their own mine, and do but little custom work. In addition there are two other small mills which treat a few tons each daily, and a small one for wet treatment, which is being tried. Of the mines, the Leeds Company's is the most developed. It is down several hundred feet and some drifting done, making, it is said, a good showing. The rest are as yet but little opened, being generally from ten to sixty feet deep. Among the best looking may be mentioned the Stormont, Duffin, Barbee's, Vanderbilt, Emily Jane, Smith, and others.

The amount of good ore on the various dumps and the bullion shipments of the mill (over seventy thousand dollars) testify to what *has* been done, while the present activity of mining men and some California companies argues well for the future. I regret that lack of time and data prevented a fuller and more positive description of this most interesting country, and a definite conclusion as to the epoch to which these rocks belong. Certain things, such as the red sandstone, proximity of coal, abundance of carbon, and appearance of certain plants resembling those of the carboniferous, suggest that period, but without further examination it would be premature to pronounce it such, as it might be of a much later epoch.

C. F. A.

SALT LAKE CITY, UTAH, April 14, 1877.

A REVOLUTION IN HORSESHOEING PRICES.—A sensation has been produced among the horseshoers and horse owners of New York by the reduction of the price of shoeing from $3 50 to $1 50 per set of four shoes by the Goodenough Horseshoe Manufacturing Company. This heavy reduction, however, has been accompanied by an announcement which reveals the existence of a very singular condition of affairs in the business. The company declares that it has absolutely abolished all coachmen's and groom's commissions, and adds that, if it is considered by any of its customers necessary that their servants be "staked," such customers are not desired. The only terms are cash when the work is done. Before the advent of the Goodenough Company not a horse was shod in the city of New York under $3. To-day the average price of the work is $2. This has been brought about entirely by the competition introduced. The number of horses in the city and vicinity is estimated at about 50,000, each of which is shod, on the average, once a month. The horse-railroads, of course, are the greatest patrons. The contract price of the Second Avenue Railroad Company is $12,000 less than by the old method. The Belt Line's contract is $13,000 less. The saving to a company making use of the Goodenough Company's method is not far, therefore, from $150,000 a year.

THOUGHTS ON THE THERMIC CURVES OF BLAST FURNACES.*

By H. M. Howe, A. M., E. M.

GENTLEMEN: I wish to present to you a few thoughts on some of the phenomena and laws of iron smelting. Owing to the great complexity of the subject, to the great variety of points to be taken into consideration, many of which are very poorly understood, and to the meagerness and even conflictoriness of our information with regard to some of the most important laws which govern the subject, the fruits of such thoughts as I venture to offer you must be received as speculations, not as facts. Nevertheless, in discussing old phenomena from new standpoints, thus furnishing a metallurgical parallax, if I may say so, these theoretical speculations may have their value in helping to a clearer comprehension of the phenomena and laws we now know, and in suggesting new lines of inquiry.

While an increase of height in blast furnaces is not always followed by increase in their power of production, experience proves that it tends to increase it; for while we have many cases of short furnaces producing more iron than longer ones, yet enormous productions, such as those of the Lucy and Isabella furnaces of Pittsburg, and of the furnaces of Esch sur l'Alzette in Luxembourg, have never been reached in short furnaces. We may safely infer that height is an element essential to great production, though of course not the only essential element, and that, in the case of high furnaces which are not capable of great production, some other essential element is wanting. Moreover, experience teaches that within limits increase of height tends to increase the producing power in a still higher ratio. Thus, in the Esch furnace, which is 19·8 meters (65 feet) high, 393 tonnes (or 387 gross tons) of 31½ per cent. ore have been smelted in twenty-four hours, with coke containing 18 per cent. of ash. Now, I doubt very much whether a furnace half as high (or 9·77 meters = 32½ feet high), no matter how broad it be, could, under any circumstances whatever, smelt 98·5 tonnes (or 97 gross tons) of such ore in a day, or one-fourth as much as the Esch furnace.

Without discussing the other elements which are essential to great production, and without even asserting in what cases increase of height will increase production, I propose to examine the element of height alone, simply trying to explain why, when all other circumstances are favorable, a slight increase of height may produce a much more than proportionate increase of productive power.

The thermic curves (or curves showing the relation between the temperatures of different points in the furnace and the height of those points above the furnace hearth) of the Clarence furnace, as given by Bell,† I believe throw some light on this subject, and show us one, at least, of the reasons why the maximum production of very tall furnaces exceeds the maximum output of short ones, in a much greater ratio than that of the length of the tall ones to that of the short ones. [In these curves, Figs. 1 and 2, *N N N N*, the ordinates are proportional to the heights of the different points in the furnace above the hearth, the abscissæ to the temperatures which Bell found at these points. The full line *N N* in Fig. 1 is the curve determined by Bell, the broken line *M M* being an imaginary curve of temperature to which I shall refer later].

The shape of these curves is such as to lead us to infer that, if either furnace be so lengthened as to lower the temperature at which the gases escape, its upper and cooler zones will be lengthened by almost the whole amount of the total increase of heat of the furnace, while the lower and hotter zones will be hardly lengthened at all. This inference is strengthened by the fact that these upper zones in the 24 m. furnace exceed in length the corresponding zones in the 14 m. furnace in a much higher ratio than that of the total length of the former furnace to that of the latter, while the length of the hot zones is nearly the same in both furnaces. After dwelling on this point I shall try to show that the productive power of a furnace is limited by the length of the coal zones, and that it is probably nearly independent of the length of the hot zones.

Fig. 1.

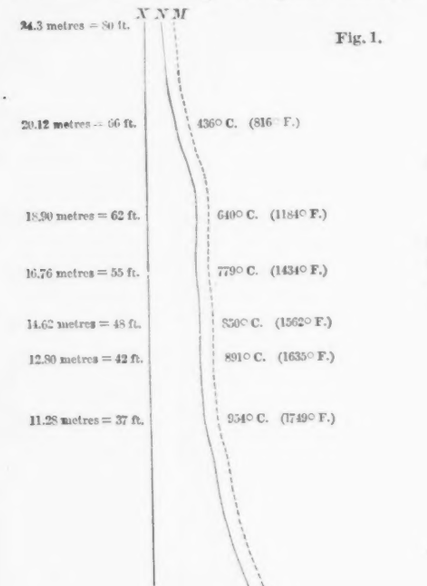
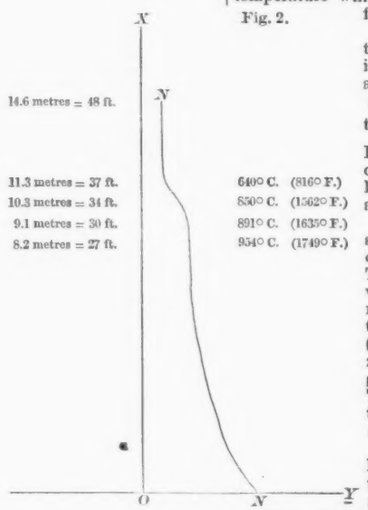


Fig. 2.



I.

Taking, first, the case of the 24 m. furnace, let us assume—

(1.) That the gases escape at a temperature of 400° C. (752° F.).

(2.) That they weigh 6·6 tonnes per tonne of iron (or 130 cwt. per ton of iron).

(3.) That their specific heat is 0·24.

(4.) That the minerals weigh 3·5 tonnes per tonne of iron (or 70 cwt. per ton of iron).

(5.) That their specific heat is 0·20.

Let us use for our unit of the quantity required to raise one kilogram of water one degree Centigrade.

Now let us suppose that, without altering the other conditions of the furnace in the least, we raise its walls to such a height that the gases are cooled* 22°, and escape at 378° C. instead of at 400° C. This will imply that they transfer to the minerals in the newly added portion of the furnace $22 \times 0{\cdot}24 \times 6500 = 38{,}848$ calories, which will raise the temperature of the latter by $\frac{34{,}848}{3500 \times 0{\cdot}2} = 50°$ C.

At first sight it would appear that the radiation and conduction of heat from the hearth, and the transfer of heat to the minerals from the volume of gases rushing up the furnace, being such that the minerals arrive at each particular level at a certain temperature, the further transfer of 38,848 calories to them in the upper part of the furnace would cause them to arrive at each successive level with 34,848 calories more than they formerly did, and, therefore, at a temperature 50° higher, provided we do not derange the working of the furnace. Though, as I shall try to show, this may not be exactly true, let us assume for the present that it is.

TABLE I.

Height above Hearth.		Original Temperature.	Temperature after Increase of Height.	Height above Hearth.		Original Temperature.	Temperature after Increase of Height.
Meters.	Feet.	Cent.	Cent.	Meters.	Feet.	Cent.*	Cent.
24·38 =	80·00	360°	410°	12·80 =	42·00	891°	941°
21·58 =	70·8	410°		12·48 =	40·94		954°
20·12 =	66·00	436°	486°	11·28 =	37·00	954°	1004°
19·82 =	65·02	486°		10·10 =	33·15		1065°
19·19 =	62·98		640°	9·14 =	30·00	1065°	1115°
18·90 =	62·00	640°	690°	6·66 =	21·85		1336°
17·54 =	57·56		779°	6·10 =	20·00	1336°	1386°
16·76 =	55·00	779°	829°	3·35 =	11·31		1717°
16·13 =	52·93		850°	3·05 =	10·00	1717°	1767°
14·90 =	48·59		891°	O		2226°	2276°
14·63 =	48·00	850°	900°				

Temperature of Zone.	A. L, Original Length of Zone	B. L¹, Length of Zone after Increase of Height.	C. $\frac{L^1}{L}$
Centigrade.	Meters. Feet.	Meters. Feet.	
410° to 486°	1·77 = 5·8	4·27 = 14·00	2·41
486° " 640°	0·92 = 3·02	0·92 = 3·02	1·00
640° " 779°	2·13 = 7·00	1·66 = 5·46	0·78
779° " 850°	2·13 = 7·00	1·41 = 4·63	0·66
850° " 891°	1·83 = 6·00	1·23 = 4·04	0·67
891° " 954°	1·52 = 5.00	2·39 = 7·85	1·57
954° " 1065°	2·13 = 7·00	2·37 = 7·79	1·11
1065° " 1336°	3· 5 = 10·00	3·36 = 11·30	1·13
1336° " 1717°	3·05 = 10·00	3·06 = 10·54	1·05
Over 1417°	3·05 = 10·00	3·36 = 11·31	1·13
410° to 640°	2·68 = 8·8	5·19 = 17·02	1·94
Over 640°	18·90 = 62·00	19·19 = 62·98	1·01

In accordance with this assumption, I have prepared Table I., in the first column of which are the heights of several points above theh earth; in the second column are the temperatures which Bell found to exist at these points; in the third column are the temperatures which will prevail after the uniform elevation of temperature which we are supposing to follow the increase of height of the furnace.

Dividing the furnace arbitrarily into zones of temperature (in the highest of which the temperature is between 360° and 410°, in the next between 410° and 486°, in the next between 486° and 954°, etc.), I have placed in column A the original lengths, L, of the several zones; in column B their lengths, L^1, after the increase of height; and in column C the ratio $\frac{L^1}{L}$. (Of course, I cannot give the length of the zone 360°—410° C. after the increase of height, as I have no data for determining the 360° C. level. The temperatures of several of the levels I have arrived at merely by interpolation.)

What strikes one on glancing over the table is that column C shows that the upper and cooler zones of the furnace are increased in a much higher ratio than the lower and hotter ones. Thus, while the distance from where a temperature of 410° prevails to the hearth is lengthened by 2·8 meters (9·2 feet), 2·5 meters (8·2 feet) of this are gained by the region lying between the points where the temperatures of 410° and of 486° C. prevail (which I shall for briefness call the zone of 410°—486°). This zone is lengthened about 141 per cent., while the entire region between it and the hearth is lengthened only 1 per cent. The zone 410°—640° is lengthened about 94 per cent., while the whole space which is hotter than 640° is lengthened only 1½ per cent.

It will be noticed that the zones immediately beneath the 640° level are decreased by the change; while below the 891° level the zones are lengthened, the increase being most marked in the zones farthest from the hearth.

These effects are due to the shape of the thermic curve. If it were throughout convex to *OX*, and constantly approaching verticality (but never passing it) as it receded from *OY*, all the zones would be lengthened by the elongation of the furnace, the percentage of increase being greatest in the upper zones, and decreasing rapidly as we approach the hearth. It is on account of the flexure of the curve towards the axis, at the point 7·7 meters above the hearth, that the zones immediately beneath the level, from 640° to 891°, are shortened. So the

* A paper read before the American Institute of Mining Engineers, at the Philadelphia meeting, October, 1876.

†*Journal of the Iron and Steel Institute*, November, 1871.

* Although the 24 m. furnace is so high that in point of fact it cools its gases before their escape probably as far as is practicable, and although, therefore, a further increase of height might not actually effect any farther cooling of the escaping gases, it is perfectly fair for the purposes of my present argument to assume that it would. For my argument has only to do with the *shape* of its thermic curve, which is in all probability so like those of shorter furnaces whence the gases escape much hotter that the inferences which I shall draw from it (and which, of course, apply only to furnaces, the temperatures of whose escaping gases would actually be lowered by an increase of height) will be perfectly applicable to them. The thermic curve of the 14 m. furnace bears out these inferences in every respect.

zones below the 10·7 meter level are lengthened (the percentage of increase diminishing as we approach the hearth) on account of the convexity of the curve towards the axis OX below that level.

The rationale of this is evident. Where the curve is convex to OX the ratio $\frac{dx}{dy}$ increases as we ascend; that is to say, the temperature diminishes at a constantly retarded rate as we ascend, each degree of temperature exists over a greater length than the one beneath it, and each zone including a given number of degrees of temperature is longer than the zone which includes the same number of degrees immediately beneath it.

Now, if we raise the temperature of the furnace uniformly, we establish a new curve of temperature, exactly parallel to the first, such as the curve MM, Fig. 1. Each degree of temperature will now be found at a point farther from the axis OY than before, and each zone a little farther from the hearth. But, as we have seen, on such a convex curve a zone of a given number of degrees of temperature covers a greater length the farther from this axis it is. Therefore, after a uniform elevation of temperature throughout the furnace, each zone situated on the convexity of the curve will be lengthened. Similar reasoning will show that zones on the concave portions of the curve will be shortened by a uniform elevation of temperature.

The ratio of the percentage of increase of the upper zones to that of the lower ones depends only very slightly upon the comparative raising of the temperature of the upper and lower portions of the furnace. If, on the one hand, the increase of temperature caused by such a lengthening were more marked in the lower part of the furnace than in the upper part (and it is very difficult to imagine that it could be), the lengthening of the upper zones would be relatively slightly less, as compared with that of the lower ones than is shown in Table I. If, on the other hand, the elevation of temperature were greater in the higher regions of the furnace than in the lower (and I shall try to show that it must be), the upper zones would be lengthened still more than we have supposed, and the lower ones still less, as I shall soon show in Table II.

Now, there are two important reasons why all the heat saved by the elongation of the furnace cannot reach the hearth, and, therefore, why the temperature there cannot be raised so much as that of the upper part of the furnace.

First, with regard to the effect of the elongation of the furnace on the rate at which the gases impart their heat to the minerals at the different levels, we must remember that, while the latter are supposed to arrive at each level a little hotter than they did before the furnace was lengthened, the initial temperature of the gases will be very little altered, since the O and N they contain in the lower part of the furnace (which come exclusively from the blast) start at the same temperature as previously, the C alone coming from the minerals, and, therefore, having a slightly higher temperature. The C, however, constitutes only about one-seventh of the initial weight of the gases, so that their initial temperature will be raised only about one-seventh as much as the temperature of the minerals is in the neighborhood of the tuyeres. Of course this raising of the temperature of the minerals more than that of the gases, and thus bringing their temperatures nearer together, will cause the transfer of heat from the gases to the minerals to take place less rapidly; thus the gases will give up less of their heat in the lower regions after the increase of heat than before it, and have so much the more heat to give to the minerals in the upper regions, and thus raise the temperature of the upper regions still further.

Moreover, as the size (and with it the radiating surface) of each zone is increased, the amount of heat lost in each zone by transmission through the walls and consequent radiation from the outside of the furnace will be increased. Therefore, less of the additional heat transferred from the gases to the minerals by the increase of height will get to the lower zones than to the upper ones, each zone getting a little less of this additional heat than the one above it. Bell considers that the loss by radiation is 182,808 calories; according to this, if, as we have supposed, our furnace is lengthened 14 per cent. below the 410° level, the loss by radiation would be increased by $\frac{182{,}808 \times 14}{100} = 25{,}593$ calories, the total gain of heat by the lengthening of the furnace being, as we have seen, 34,848 calories. But as most of the increase of length would be in the upper and cooler parts of the furnace, from which radiation is much less rapid than from the hotter parts, probably only about 15,000 more calories will be lost by radiation after the elongation than before it. Thus, it seems safe to conclude that the elevation of temperature caused by this lengthening of the furnace will certainly not be greater in the lower part of the furnace than in the upper, but that it will probably be less.

TABLE II.

Height above Hearth.	Original Temperature.	Temperature after Increase of Height.	Height above Hearth.	Original Temperature.	Temperature after Increase of Height.
Meters. Feet.	Cent.	Cent.	Meters. Feet.	Cent.	Cent.
24·38 = 80·00	360°	410°	12·80 = 42·00	891°	917°
20·12 = 66·00	436°	470°	11·86 = 38·91		954°
20·02 = 65·69		486°	11·28 = 37·00	954°	977°
19·82 = 65·02	486°		9·51 = 31·19		1065°
19·12 = 62·73		640°	9·14 = 30·00	1065°	1083°
18·90 = 62·00	640°	678°	6·23 = 20·43		1336°
17·31 = 56·80		779°	6·10 = 20·00	1336°	1348°
16·76 = 55·00	779°	814°	3·09 = 10·13		1717°
15·68 = 51·44		850°	3·05 = 10·00	1717°	1723°
14·63 = 48·00	850°	882°	0	2226°	2206°
14·17 = 46·46		891°			

Temperature of Zone.	A. L, Original Length of Zone.	B. L¹, Length of Zone after Increase in Height.	C. $\frac{L^1}{L}$
Centigrade.	Meters. Feet.	Meters. Feet.	
410° to 486°	1·74 = 5·78	4·36 = 14·31	2·48
486° " 640°	0·92 = 3·02	0·91 = 2·96	0·98
640° " 779°	2·13 = 7·00	1·82 = 5·93	0·85
779° " 850°	2·13 = 7·00	1·63 = 5·30	0·79
850° " 891°	1·83 = 6·00	1·52 = 4·98	0·83
891° " 954°	1·52 = 5·00	2·30 = 7·55	1·51
954° " 1065°	2·13 = 7·00	2·35 = 7·72	1·10
1065° " 1336°	3·05 = 10·00	3·28 = 10·76	1·08
1336° " 1717°	3·05 = 10·00	3·14 = 10·30	1·03
Above 1717°	3·05 = 10·00	3·09 = 10·13	1·01
410° to 640°	2·68 = 8·80	5·36 = 17·27	1·97
Above 640°	18·90 = 62·00	19·12 = 62·73	1·01
410° to 850°	6·95 = 22·80	8·71 = 28·36	1·25

To illustrate the effects of this greater elevation of the temperature of the upper zones than that of the lower ones I have prepared Table II., on the extreme assumption that the lengthening of the furnace will not raise the temperature of the hearth at all, but that the elevation of temperature (assumed to be 50° at the throat) is less and less at each successive lower level, being finally nil at the hearth.

The results are here practically the same as in Table I., though the lengthening of the upper zones is comparatively slightly greater than in that table. Thus the zone 410° to 640° is lengthened here 97 per cent. against 94 per cent. in Table I., while the distance from the 640° level to the hearth is practically unaltered.

Now, if the percentage of increase of the upper zones be greater than that of the lower ones, and therefore greater than that of the furnace as a whole, both (1) when all the heat gained by the lengthening reaches the hearth as in Table I., and (2) when none of this heat does as in Table II., of course it must be greater than them in any intermediate case, in which a portion of it reaches the hearth.

Since previous reasoning has shown us that the elongation of the furnace is most unlikely to raise the temperature of the upper zones less than that of the lower ones, but that we have good reason to expect the reverse, we may conclude that the ratio of the percentage of increase of the upper zones to that of the lower ones will certainly not be less than it is shown to be in Table I., but that it will, if anything, be slightly greater.

Indeed, even if the temperature of the lower part of the furnace could be raised slightly more than that of the upper part (which seems hardly possible), the results of Table I. would be only slightly modified.

Coming now to the case of the 14·6 meter furnace, I have ventured to alter its curve a little; not that it is necessary to do so in order to bear out my reasoning, but because, as I understand Mr. Bell, he has purposely distorted it to illustrate another point. By referring to the original curve (*Journal of the Iron and steel Institute*, November, 1871), it will be seen that it *recedes* from the vertical axis, as it rises above the 11·2 meter level, which would imply that the furnace is hotter at the mouth than at a point 4 meters lower down. This seems impossible under normal conditions, and the text shows that Mr. Bell does not mean to imply that the furnace is actually hotter at the top than below it.

TO BE CONTINUED.

MINING NEWS.

Staff Correspondence of the Engineering and Mining Journal.

COLORADO.

The late strike in the Susquehanna Tunnel, near Silverton, is attracting great attention. A four-foot vein of ore rich in gray copper was opened, which promises to be very productive. By private letter from that town we learn that Messrs. Green & Co. are making active preparations for the summer campaign at their works, while the manager of Melville & Summerfield's new amalgamation and chlorination works is rapidly getting into shape for reduction.

The ore supply in the northern part of the territory is reported by most of the large smelting establishments as good. The Boston and Colorado works and the mills at Georgetown are full, and though the lateness of the spring and the abundance of snow has to some extent interfered with the operations of the deeper mines, the delays are but temporary and scarcely felt. The four large smelting works and four amalgamation or leaching mills are together handling about 200 tons daily, and nearly an equal amount is being handled every day in the concentration works of the State. In Park County the increase of ore production over the yield of last fall is very marked, even after allowing for the many hundred tons mined during the winter and just now beginning to move. This county showed a higher percentage of gain last year in its mining industry than any other district in the State.

The long era of dullness which fell on Caribou when the mining company Nederland failed has within the last few months given way to better times. This change has been largely owing to the successful operations of the New Jersey Company. This organization is employing a large number of men at its mine, and is affording a good cash custom market for ores at its mills. The mine is now about 300 feet deep. At the Caribou about 50 men are employed. When the mine came into the hands of its present owners, it was found to be badly robbed at all points. Every available ton of ore had been taken out that was in sight, and little or no new development made. Consequently, many thousand dollars will have to be spent in sinking and drifting before the mine can hope to become again a producer. The shaft is now over 600 feet deep, and almost all new ground opened shows rich ore in abundance. The mill at Nederland is being put in shape for work this fall.

Among other mines the Spencer is just now attracting considerable attention, and it proposes to become, when extensively opened, a more valuable property. The Consolidated Caribou Belt Tunnel is one of the important enterprises of the district. This company talk somewhat of erecting concentration works this fall at Caribou.

The move into the placer and quartz districts across the range in Summit County has already begun. This year more attention than ever will be given to development in Peru and Montezuma, and as there is now a cash market for ores at Sts. John, miners may be more inclined to sell. A few of the properties at the heads of Geneva, Hall, Handcart, and Quail valleys have been worked during the winter, but in most cases owners were unprepared for the deep snows which fall at that altitude, and were forced to shut down. The districts clustered together on the Range at this point are undeniably good. The Gilman, Treasure Vault, Revenue, Starr, Whale, Champion, Blanche, Silver Wing, and Comstock will compare favorably with any in the Territory. The magnificent work done by the Sts. John Company on Glacier Mountain is ample evidence that deep explorations will show good results.

The Hann's Peak companies, operating in the placer country beyond the North Park, are already transporting supplies and men for the summer campaign. Washing in earnest will begin this year, and it is reported that a large amount of gold will be won before the season is over.

Eighty-nine stamps are now running on ore (gold quartz) from South Mountain, in the San Juan country. The ores, as milled heretofore, will average $50 per ton. The supply on hand and in sight in the various mines is enough to keep this crushing power busy all the year, unless interrupted by accident. The Summit district this year is expected to yield nearly $500,000 against $100,000 last year.

The Russia Mine, Park County, is reported as in finer shape at present than ever before. The Russia has always been regarded as a fine property, though at times in ore of a somewhat low grade. The size of the deposits uncovered during recent work is very encouraging.

The new placer ground of the Follett Brothers, in Mayflower Gulch, a tributary of ten miles, is being put in shape for extensive operations this summer.

The capital of the Moore Mining Company has been increased to $2,000,000.

The Bobtail mine yielded during the first quarter of the year 2,745 ounces of gold, worth $44,892 50.

Two new calcining furnaces are being built at the Boston and Colorado Smelting Works, and a large ore shed erected.

A tunnel is to be run under South Mountain, Summit County, which will cut nearly all the veins of that noted hill.

IDAHO.

The *Avalanche* reports the following of the Silver City mines: In the 13th level, Golden Chariot, the ledge is looking well and shows more mineral than at any previous stage of operations. The south drift is now in 290 feet The ground is getting softer and the vein is nearly eight feet wide. The water has increased, but no difficulty is experienced in handling or removing it. The cross-drift from the 9th level east has penetrated a distance of 142 feet through good ground, and a noticeable improvement as the work progresses. At the 6th level the developments continue to be most promising. Work on the cross-drift east from the middle vein has opened up a rich and promising ore body, and everything wears a cheering look in this section of the mine. The stopes are looking well and are turning out some high grade ore. The operations carried on from the winze between the 6th and 7th levels are resulting in the most encouraging developments, and altogether the condition and prospects of the mine are quite as hopeful and promising as ever. The result of recent operations establishes beyond question the existence of a rich and extensive ore body in the South Chariot, and everything points to a hopeful future for that mine, with the commencement of a judicious system of operations. The Chariot mill is running on custom ore.

Affairs at the Empire have taken a new turn during the past week. It is known that disputes have been pending relative to the title of the original claimants, and in the meantime the mine has been worked by Mr. Terrill and other parties. Recently on the application of C. W. Moore and other gentlemen interested in the property, a restraining order was issued by Judge Hollister, and on Monday last the Sheriff served the requisite papers upon Messrs. W. V. Williams, F. Hunt, W. H. Dewey, and others who, upon the inauguration of these proceedings, discontinued work at the mine to await further action at the coming term of the District Court.

Many are looking forward to the resumption of active operations in the Poorman as the coming dawn of a new era in this camp. That a magnificent bonanza exists there below the 7th level, no practical miner acquainted with the locality now entertains any doubt.

The placer diggings at Meadow Creek, about twenty miles from town, have been turning out well during the past month or two. Five men took out about a thousand dollars in twenty days by ground-sluicing. Messrs. Nordyke & Co., who own the grounds and the water right, will have hydraulic works there next season, and will be able to do a fine business for years to come.

There was a report of a rich strike in the Belle Peck yesterday, which is quite likely to prove correct.

MONTANA.

From the Butte *Miner* of April 24 we condense the following notes of progress in that growing camp:

On the Bunker, Clear Grit, Modoc, Adelaide, and Dexter mines, the annual representation work is being done.

A full new set of stamps and dies are being put in at the Dexter mill. The bullion shipments for the week ending the 21st amounted to $4,000, derived mainly from low grade ore. Some material of a higher grade is to be run through shortly.

Some excellent mineral has lately been taken from the Uintah lode, which shows free gold, as well as high assays in silver. The owners feel great encouragement over their prospect, and propose to open the mine thoroughly.

The main shaft on the Lexington is now down 110 feet, and has struck, at last, a good flow of water, so that pumping or hoisting machinery of considerable power will be needed. If the mine shows as well below the water level as above, Butte miners will be greatly encouraged, and especially Mr. Davis, the owner of the Lexington. Above the water the ore body, which has shown so well, displays no signs of exhaustion. Thirty-two men are employed on the mine.

We note also that the Gem, owned by Mr. Davis, is giving employment to six men. It is a copper vein.

The Davis mill is crushing ten tons daily, and has recently added another pan and settler which will raise its power to twelve tons. Still another pan and settler will be put in place in a few weeks, when the stamps can be run to their full capacity. Bullion shipments from this mill continue regular and steady.

The Ohio Concentration Works are reported as running successfully on low grade copper ores.

The La Plata is down 170 feet, and still holds a dry, clear vein and a good seam of ore.

The hoisting arrangements at the Rainbow are completed, and sinking has been resumed. There is considerable water, but not enough to seriously retard operations.

The Burlington vein is yielding finely at every point opened, and shows a good ore body in the deepest point attained on the vein. The ore now being sent to mill yields 80 to 100 ounces per ton, and is saved up to about 80 per cent. At the Young and Ronderbush claim about 250 tons have accumulated, awaiting treatment.

Navigation on the Missouri is open for the spring, and freight has also already started across the Snake Valley from Corrinne, so that the season for the Territory is rapidly opening. There is talk of a renewal of work on the Northern Pacific, which, it is hoped, may amount to something.

The Montana Company at Jefferson are keeping their Krom mill steadily employed on ore from their own mine (the Argentum), and are reported to have made large contracts with the Rumley, Comet, and Gregory for low grade ore.

NEW MEXICO.

The Mimbris Mining and Reduction Company's mill has produced during the ten months ending March 31, 95,000 in silver bullion.

Attention is being directed to the placers and bars of Burro Canon, where many fair-sized nuggets have been picked up. The Gulch does not afford enough water for extensive operations, but it is thought that that necessary element can be brought in.

It is reported that there is much more water than usual this spring in the mountain streams, and consequently a promise of an exceptionally good season for the gulch and placer miners. We hear again some talk of the construction of a big ditch from the Pecos River to work a portion of the dry placers of the old Placer Mountain range. If Eastern capital can be induced to examine the possibilities of such an enterprise and to carry it through, the results would be greater than is anticipated even by the present projectors of the work.

NOTES.

CONTRACTS FOR MINE WORK.—The New Almaden Quicksilver Mining Company (J. B. Randol, manager, New Almaden, Cal.) asks for proposals for driving 17 levels. Bids will be opened on the 31st May.

THE GERMAN PARLIAMENT REJECTS THE BILL FOR IRON IMPORT DUTIES.—The German Parliament on the 27th ult. rejected the bill for imposing compensatory duties on iron and iron goods, by a vote of 211 against 111.

ABENDROTH & ROOT MANUFACTURING COMPANY having received several large orders of late, the company is erecting a large extension to its present works, 75 x 100 feet, and intends doubling its present facilities. This company is working to its full capacity on spiral tubing.

E. A. PACKER & CO.—We note the withdrawal of Daniel Packer from the firm heretofore existing under the name of E. A. Packer & Co., and the formation of a copartnership, for the transaction of a general coal commission business, under the name of E. A. Packer & Knowlton.

THE WATER IN THE SHORT MOUNTAIN COAL MINES.—The large bull pump at these mines was put in operation on the 2d inst. The water which accumulated in the mines in extinguishing the fire is being rapidly removed, at least to an extent that it will not interfere with mining operations east of Short Mountain.—*Lykens (Pa.) Valley Record.*

AN OPENING FOR AMERICAN RAILWAY SECURITIES ABROAD.—Mr. Louis J. Jennings, the able London correspondent of the *World*, writes that the war in Europe will open a splendid opportunity to American railway securities in London. Let the managers of roads prepare to take advantage of it by making a candid statement of the real condition of the roads they control, so that their securities may be intelligently dealt in.

COAL-PIT DISASTER IN WALES.—An explosion and inundation at the Troedyrhiw colliery, at Pontypridd, Wales, on Wednesday, April 11th, imprisoned nine men behind a column of coal 40 yards thick. Continuous operations for their rescue resulted in opening communication with them, April 19th. Five were found alive. Four had wandered to other parts of the mine perished.

UNPROFITABLE COLORADO GOLD MINES.—Judge Pratt, of the Supreme Court Circuit, Kings County, N. Y., granted an order on the 21st ult. dissolving the Granada Gold Mining Company and the Alps Gold Mining Company, of New York. Both companies owned mines in Colorado, but they have never paid. Since 1866 they have been in the hands of a receiver and referee. The referee's report was received, setting forth the facts as above.

STEEL FROM SOUTHERN ORES.—We have received from Messrs. REES & WILDER, of Chattanooga, Tenn., two handsome specimens of fine cutlery, a pocket-knife and a razor, bearing the trademark Rees & Wilder Magnetic," together with the brand of a Sheffield house. The blades of this cutlery are produced from the magnetite of the Iron Mountain or Cranberry Vein, on the line between Carter County, Tennessee and Mitchell County, North Carolina. This ore is worked in Catalan fires, and hammered directly into bars of wrought iron, which are worked in crucibles to produce the fine steel.

THE MELVINA MINE, COLO.—In our last issue (p. 301), we published in our Colorado mining news a statement that "the Melvina Mine, one of the richest and most productive Colorado tellurium mines, has at last fallen into the hands of the lawyers a bill has been filed in Chancery for a one-half interest in the mine." This paragraph relates to a claim which, we are informed by one of the owners of the mine, has no foundation in fact, but is merely a blackmailing scheme, and such indeed it would appear from our private reports. Unfortunately such things are so common wherever a good mine is offered for sale that it alone should not have much weight with those who are disposed to invest in the property. In this case the owners profess their ability to make the perfectness of the title apparent to any one interested in the matter. We shall give some particulars of the remarkable richness of this mine in an early number.

THE PRODUCTION OF COAL IN GREAT BRITAIN.—Although no statistics have yet been issued, official or otherwise, regarding the production of coal in the United Kingdom in 1876, the *Newcastle Chronicle* is able to inform its readers, on the best authority, that the exact output for that year, as ascertained by the Inspector of Coal Mines, is 134,125,166 tons, being an increase of 2,258,061 tons on the production of 1875, which was returned by Mr. Hunt at 131,867,105 tons. It was not generally expected that 1876 would show an increase on the previous year, taking into account the terribly depressed condition of trade, and the fact of such a large additional output of coal is calculated to cause not a little satisfaction at a time when the coal trade is so seriously depressed.—*Iron.*

SALE OF THE POTTSVILLE MINERS' JOURNAL.—The *Miners' Journal*, daily and weekly newspaper, together with the book and job printing office, was sold on the 1st inst. at public sale to close the estate of the late Col. Robert H. Ramsey. The purchasers were P. W. Sheafer, Frank Carter, and W. R. Cole. The latter, who has been the manager of the journal since the death of Col. Ramsey, will continue the management of the paper.

UNITED STATES ASSAY OFFICE.—Statement of business for the month ending April 30, 1877:

DEPOSITS OF GOLD:		U. S. bullion, Nevada....	$80,000 00
Foreign coin.....	$87,000 00	" " New Mexico	33,500 00
Foreign bullion.....	44,000 00	" " Utah	200,000 00
United States bullion.....	356,000 00	" " Arizona	3,500 00
" " (re-deposits)	40,000 00		
Jewelers' bars.....	45,000 00	Totals of silver deposits.	$729,000 00
Totals of gold deposits..	$572,000 00	Aggregate deposits....	$1,301,000 00
DEPOSITS OF SILVER:		Gold bars stamped	$411,540 57
Jeweler's bars.....	$9,500 00	Silver " "	813,445 30
Foreign coin	2,000 00		$1,224,985 87
Foreign bullion.....	8,500 00	Transmitted to U. S. Mint, Phila., for coinage, gold..	341,691 72
U. S. bullion (contained in gold)	4,000 00	Transmitted to U. S. Mint, Phila., for coinage, silver.	202,555 62
U. S. bullion (re-deposits).	86,000 00		$544,247 34
" " Colorado...	275,000 00		
" " L. Superior.	1,500 00		
" " Montana...	25,500 00		

The Philadelphia Mint coinage for April was as under:

	No. of pieces.	Value.
Gold.....	11,262	$170,830
Silver.....	2,205,000	889,000
Total.....	2,216,262	$1,059,830

There wa no base coinage whatever at the Mint during the last month.

THE PETROLEUM COMBINATION.—We are evidently upon the eve of very important events in the history of the petroleum trade. The refining business is either to be contended for by three powerful opposing factions or another deal will shortly be made for a coalition of interests. The Standard were masters of the field last year, but now they will have for competitors Prentice, backed by his Boston ring of Union Pacific capitalists, who are believed to control from $50,000,000 to $100,000,000, and the Empire Line, or Potts, backed by the Pennsylvania Railroad. Practically speaking, all three of these concerns have capital unlimited, and, whether they mean war or peaceful coalition, they are destined to have a most powerful influence upon the future of the petroleum trade. Prentice has already started a large refinery in New York city, and has another in Buffalo nearly completed, while a pipe line from the region to the seaboard is an integral part of his scheme for competing against his opponents. The Empire Line now control about 6,000 barrels of refining capacity per day in New York city, and they are building a large refinery in Philadelphia.—*Titusville Herald.*

EXPLOSION OF FIRE-DAMP AT THE WADESVILLE SHAFT Pa.—On the 9th inst, between 10 and 11 A. M., a terrible explosion occurred in the Wadesville Shaft, formerly owned and worked by the Hickory Coal Company, but now by the Philadelphia and Reading Coal and Iron Company. This shaft is 666 feet deep. The explosion occurred in a distant gangway, at least a mile from the bottom of the shaft, and only to be reached by half an hour's tedious walking through bewildering passages, including the ascent of two inclined planes cut in the coal. The mine was thoroughly inspected on the morning of the explosion before the men were permitted to enter, and the working parts found free from fire-damp. It appears from an inspection since the accident, that it was caused by the fall of a mass of rock in the abandoned portion, which carried down with it a quantity of gas hanging in deep cavities in the roof. Its force was confined to a limited area, and there are no marks of a general explosion. The damage to the mine is but slight. Had the mine not been free from gas, the result would probably have been appalling, as there were between 100 and 200 miners at work in the mines at the time. Of the men who were killed by the explosion, all were married and had families, with one exception. The number killed was 7, and wounded 6, of whom two or three will scarcely recover. The *Ledger* of to-day says: "The story of the efforts to rescue those in the mine (whether dead or alive), again brings into prominence the unselfish bravery of these workmen. The continued dangers which nearly always follow a mine explosion did not deter the miners in their efforts to remove the hundreds of tons of debris behind or under which were the dead or imprisoned bodies of their fellow workmen. Although the foul air would not permit a man to labor there more than ten or fifteen minutes at a time, gang after gang of men volunteered, that by united efforts they might keep up continuous work until all the bodies were unearthed. The suspense was not long continued as in the recent mine disaster in Wales, where a half dozen miners were imprisoned for a week; but although this accident lacks that element of intensified interest, the actors in it are no less worthy of high approbation for their heroic efforts to rescue their companions.

STATISTICS OF COAL PRODUCTION.

This is the only Report published that gives full and accurate returns of the production of our Anthracite mines.

Comparative Statement for the week ending May 5, and years from Jan 1st.

Tons of 2,240 lb.	1877. Week.	1877. Year.	1876. Week.	1876. Year.
Wyoming Region.				
D. & H. Canal Co.	54,304	696,059	54,032	597,048
D. L. & W. RR. Co.	53,305	676,942	25,697	424,216
Penn. Coal Co.	21,669	324,259	19,582	301,739
L. V. RR. Co.	24,597	331,159	21,709	305,414
P. & N. Y. RR. Co.	1,205	15,594	670	9,080
C. RR. of N. J.	25,468	461,779	37,927	348,672
Penn. Canal Co.	15,065	50,716	10,491	41,061
	195,523	2,556,608	1 0,,08	2,027,230
Lehigh Region.				
L. V. RR. Co.	68,348	878,802	43,841	664,631
C. RR. of N. J.	28,012	469,926	30,942	313,504
D. H. & W. B. RR.	63	5,688	681	12,591
	96,423	1,354,416	75,464	990,726
Schuylkill Region.				
P. & R. R. RR. Co.	158,327	1,678,066	145,713	1,136,068
Shamokin & Lykens Val.	12,609	159,368	16,140	146,189
	170,936	1,837,434	161,853	1,282,257
Sullivan Region.				
Sul. & Erie RR. Co.	113	3,988	1,456	18,880
Total	462,995	5,752,446	408,881	4,319,093
Increase	54,114	1,433,353	....	....
Decrease	....	...	....	....

The above table does not include the amount of coal consumed and sold at the mines, which is about five per cent. of the whole production.

Receipts of Coal at Boston, for the week ending May 4, and years from Jan. 1.

Tons of 2,240 lb.	1877. Week.	1877. Year.	1876. Week.	1876. Year.
From				
Alexandria and Georgetown	2,430	4,328	720	7,946
Philadelphia	20,517	125,596	15,576	108,333
Baltimore	7,534	33,644	920	29,513
Other places	11,579	70,193	4,268	75,072
Great Britain	....	707	...	3,407
Nova Scotia	...	3,669	....	199
Total	42,060	238,137	21,484	224,470

Perth Amboy business:

	Tons.
Received for the week	26,669
Shipped for the week	31,240
On hand May 5	139,351

The Exports of Coal from Baltimore for the week ending May 4, were 595 tons, and since Jan. 1st, 13,938 tons as against 10,860 tons for the corresponding period of 1876.

The decrease of shipments of Cumberland Coal over the Cumberland Branch, and Cumberland and Piedmont Railroads amounts to 23,600 tons, as compared with the corresponding period in 1876.

The Receipts of Coal at Rondout, N. Y., by the Delaware & Hudson Canal for the three days ending May 9 were 190 boats, carrying 24,573 tons.

Belvidere Delaware RR. report for week ending May 5.	Week	Year. 1877.	Year. 1876.
Coal for shipment at Coal Port (Trenton)	1,206	5,092	51,437
" " " " South Amboy	18,705	207,295	166,358
Coal for distribution	3,467	59,641	50,173
Coal for Company's use	1,345	27,875	18,291

The production of Bituminous Coal for the week ending May 5, was as follows:

Tons of 2,000 lb., except where otherwise designated.

Cumberland Region, Md.	Week, Tons.	Year, Tons.
Tons of 2,240 lb	40,218	366,324
Barclay Region, Pa.		
Barclay RR. tons of 2,240 lb	4,517	121,392
Broad Top Region, Pa.		
Huntingdon and Broad Top RR	2,219	50,938
*East Broad Top	1,040	16,031
Clearfield Region, Pa		
*Snoe Shoe	697	15,664
*Tyrone and Clearfield	21,031	427,659
Allegheny Region, Pa.		
*Pennsylvania RR	3,348	64,300
Pittsburg Region, Pa.		
*West Penn. RR	3,796	64,264
*Southwest Penn. RR	24	15,816
*Penn & Westmoreland gas coal, Pa. RR.	13,664	250,560
*Pennsylvania RR	6,591	123,631

*For the week ending April 21.

The Production of Coke for the week ending April 28.

Tons of 2,000 lb.	Week.	Year.
West Penn. RR.	1,087	25,349
Southwest Penn. RR.	10,102	192,520
Penn & Westmoreland Region, Penn. RR.	2,206	27,931
Pittsburg, Penn. RR.	3,315	49,661
Total.	16,710	295,461

COAL TRADE REVIEW.

NEW YORK, Friday Evening, May 11, 1877.

Anthracite.

Upon the whole there are fewer orders being placed for coal than there were a few weeks ago. Prices continue much as they have been, with perhaps a shade of weakness.

On Wednesday there was another combination meeting, at which there were representatives of all the interests except the Philadelphia & Reading Railroad Company. What transpired has not been made public, although it is indicated that nothing of importance was done. The meeting adjourned until the 15th inst.

Immediately after the meeting the Delaware & Hudson Canal Company issued the following circular:

"*Circular No.* 8, 1877.
NEW YORK, May 9th, 1877.

The unusual competition that now characterizes the coal trade induces us to withdraw our Circular No. 7, and to advise our friends that prices for coal will be made from day to day, to meet the fluctuations of the market, thus giving to our customers the advantages of daily quotations, which can be obtained at the office of the company on application, either in person or by letter. THOMAS DICKSON, *President.*"

It is said, that although the company is mining considerable coal, it is storing large quantities at Honesdale. The Reading company has made large inroads on the trade of this company and on that of the Pennsylvania Coal Company. It is a little too early to learn the true import of this circular, but it is generally understood to be the forerunner of a still more bitter war in prices. So far, however, it has only had an unsettling effect.

How effectual a war can be carried on by the Delaware & Hudson Canal Company can only be determined by the results. At the annual meeting of the company on Tuesday Mr. Dickson admitted that an average price of $3 10 per ton for coal at tide water was necessary to meet the company's fixed charges, while already it is reported that it has quoted prices that would average fully 25 cents per ton below this figure, and *fight* has not yet been shown by the other companies. The great offender is supposed to be the Philadelphia & Reading Railroad Company, which is said to have sold large quantities of coal at very low prices. Mr. Gowen in a statement to his stockholders and bondholders before his departure for Europe, said, that coal which cost him $1 per ton, netted $1 38¼ at the mines, after payment of full transportation charges. As the Reading company recieves considerable profit in transporting coal at present charges, there is a moderate margin upon which to conduct a war, and still leave something for the payment of "fixed charges."

Both Mr. Gowen and Mr. Dickson look to the time that will give them higher prices for their coal before they can hope for dividends. Mr. Gowen, to pay all fixed charges and a 10 per cent. dividend, asks for a net price of $1.50 at the mines for his coal, as against $1.38¼ now received, and a rate of freight not exceeding 1¾c. per ton per mile, as against 1 1-3c. now received. According to Mr. Gowen's statement, he has made during five months of dull trade about $1,200,000. During this time he only did a coal business equal to one-fifth of what his present energetic management indicates will be done during the current twelve months. Under a larger business, of course, the expenses per ton, both on mining and transporting, should be reduced; and if he were to aim at only 6 per cent. dividend, which would be very liberal for the times, he should be able to do it on the present rates of freight and prices for coal, were it not that he has a large floating debt to absorb all excess of earnings over fixed charges. Mr. Dickson asks for an advance of $1 per ton on his production of about 2,000,000 tons, to pay a dividend of 10 per cent. It is a question if ever, in ordinary times, we shall reach that range of prices, and the companies had better adapt themselves to the situation as they find it now. If prices were advanced the companies need not expect to be the only participators in it, as labor in all departments would demand its share. There is a general impression, however, that the managers of the coal companies are deceiving themselves as to the cost at which they can put coal in market.

The production of anthracite coal, last week, was 462,995 tons, as compared with 502,535 tons for the previous week, and 408,881 tons for the corresponding week of last year. The total production since January 1 has been 5,752,446 tons, as against 4,319,093 tons for the like period of 1876, showing an increase this year of 1,433,353 tons. The falling off in the production last week, as compared with the previous one, is shown to have occurred mostly on the Lehigh Valley and New Jersey Central Railroads. Delaware, Lackawanna, and Western Railroad shows an increase of about 16,000 tons, and Philadelphia and Reading about 11,000 tons.

Bituminous.

Cumberland continues to move considerable coal, although Clearfield is rather quiet. We only note contracts with the Long Island Railroad, made by Berwind White & Co. for about 24,000 tons of their "Eureka" coal, to be delivered within a year, and one with the Consolidation Coal Company, at $2 80 for coal alongside Baltimore, to be delivered to the North German Lloyd Steamship Company at that port. Prices are very much unsettled all around, and are usually kept private. Contrary to expectation the Chesapeake & Ohio Canal Company did not reduce its tolls at its meeting on Tuesday. This, however, could not readily have been done, as an invitation from the Baltimore & Ohio Railroad Company to adjust the difficulties had just been received.

Gas Coals.—It is said that the Westmoreland Coal Company has contracted to deliver 25,000 tons of its coal at the East. Prices are not strong, and business generally very quiet.

Wholesale Prices of Bituminous Coal.

Domestic Gas Coals.

Per ton of 2240 lb.	At the Shipping Ports.	Alongside in New York.
Westmoreland and Penn. at Greenwich, Philadelphia	$4 50	$5 50
" " at S. Amboy.	5 00	5 50
Red Bank Cannel Pa. at Philadelphia.	8 00	8 50
Youghiogheny, Waverly Co., at Balt.	4 50	5 65
Despard, West Va.	4 50	6 00
Murphy Run, West Va., at Baltimore.	4 50	5 80
Fairmount, West Va., " "	4 40	5 70
Newburg Orrel, Md. " "	4 50	6 00
Cannelton Cannel, West Va.	....	10 00

" Splint " at Richmond.	6 00	7 00
" Gas Coal at Richmond	4 14	5 65
Peytona Cannel W. Va. at Richmond	....	10 00

Manufacturing and Steam Coals.

Cumberland at Georgetown and Alexandria, Va	3 00@3 15	4 40
Cumberland, at Baltimore	3 15@3 25	4 70
Clearfield f. o. b. Canton, Baltimore	3 25@	4 50

Clearfield "Eureka" at mines per ton 2,000 lb., 75c. ; f.o.b. Baltimore and Philadelphia per ton of 2,240 lb., $3.25 ; f.o.b. South Amboy, $4.25 ; alongside at New York, $4.50.

Foreign Gas Coals.

	Sterling.	Am. cur'cy
Newcastle, at Newcastle-on-Tyne	8/6@10 6	5 50@ 6 00
Liverpool House Orrel, at Liverpool	25/	13 00
Ince Hall Cannel "	35/6	18 06
" Gas Cannel "	25/	10@10 50
Scotch Gas Cannel, at Glasgow, nominal,	25/ Gold.	7 50
Block House at Cow Bay, N. S.	1 75	4 75
Caledonia, at Port Caledonia	1 50	4 25
Glace Bay, at Glace Bay	1 50	4 25
Lingan, at Lingan Bay	1 75	....
International mines at Sydney	1 75	4 50
Pictou, Vale mines, at Pictou	2 25	....

New York and Philadelphia.

Wholesale Prices of Anthracite Coal f. o. b. at the Tide Water Shipping Ports per ton of 2240lb.

	Lump.	Steamer.	Grate.	Egg.	Stove.	Chestnut.
Wyoming Coals.						
‡Lackawanna and Scranton at Hoboken and Rondout	3 05	3 05	3 05	3 10	3 45	3 35
Wilkesbarre at Port Johnston	2 90	2 95	3 05	3 10	3 35	3 00
Plymouth, R. A.	....	....	3 05	3 10	3 45	3 10
Susque: Coal Co., (S. H. Brown & Co.,) At Amboy	2 85	2 85	2 90	3 00	3 60	2 25
Susquehanna coal at Philadelphia	2 75	2 75	2 60	2 65	3 25	2 75
Kingston at Hoboken	2 90	2 95	3 05	3 10	3 35	3 15
Pittston at Newburgh:						
A. S. Swords	2 95	2 95	2 95	3 00	3 40	3 25
Penn. Coal Co.	3 10	3 10	3 10	3 20	3 60	3 25
Wyoming at Perth Amboy	....	3 00	3 00	3 10	3 40	3 35
Lehigh Coals.						
Old Company at port Johnston	3 75	....	3 25	3 25	3 65	3 25
Old Company's Room Run "	3 75	....	3 25	3 25	3 65	3 25
Sugar Loaf, Hobok. & Amb."	3 75	....	3 25	3 25	3 65	3 35
Lehigh at Perth Amboy	3 75	....	3 25	3 25	3 40	3 35
Honey Brook Lehigh	3 75	....	3 25	3 25	3 65	3 25
Beaver Meadow at South Amboy	3 75	....	3 25	3 25	3 65	3 25
Mount Pleasant at Hoboken	3 75	....	3 15	3 15	3 50	3 30
Cross Creek at Elizabethport	3 75	....	3 25	3 25	3 75	3 25
Schuylkill Coals *at Port Richmond, Philadelphia.*						
Schuylkill white ash	2 75	2 75	2 75	2 75	3 10	2 75
Schuylkill red ash	....	....	....	2 85	3 20	2 75
Lorberry	....	....	3 50	3 50	3 50	3 00
Lykens Valley	....	....	3 75	3 75	3 75	3 00

‡Boats towed by the D. & H. Co. at its expense to and from New York Harbor.

Per ton.

Freight from Hoboken and Weehawken to New York 35c.
" " Elizabethport & Port Johnston to N. Y. 35c.
" " South Amboy to New York 35c.

Freight by the boats of the companies from Hoboken, Rondout, Port Johnston, Weehawken, South Amboy and Perth Amboy to New York City and vicinity 50c.

Pittston coal at New York delivered by Penn. Coal Co.'s boats 60c. per ton additional.

Lackawanna coal delivered to carts in New York or Brooklyn, 50 cents per ton additional.

Retail Prices in New York.

Anthracite.

Per 2000 lbs.	Grate and Egg.	Stove.	Chestnut.
Pittston coal, in yard	$3 90	$4 20	$3 90
Lackawanna coal, in yard	3 25	4 00	3 90
Wilkes-Barre, delivered	5 00	5 30	4 60
Lehigh and Locust Mountain, del'd	5 50	5 50	5 00
Schuylkill Red Ash, del'd	5 25	5 50	4 75

The Cost of delivery for Pittston and Lackawanna coal ranges from 40 cts. to $1 10 per ton, according to distance from the yard.

Bituminous.

Liverpool House Orrel, delivered, per ton of 2000 lb	$18 00
Liverpool House Cannel " " "	.... 18 00
American " " " "	.... 11 00
Cannelton Block, or splint, " " "	.... 10 14
American Orrel " " "	....11@00
Red Bank Cannel " " "	.... 9 00
Cumberland " " "	.... 7 00

Baltimore. May 9, 1877.

Specially reported by Messrs. E. STABLER JR., & Co.

Trade prices for Hard White Ash, Reading, Susquehanna Coal Company's, Cameron, and other White Ash, Shamokin. Bear Valley, etc. :

Wholesale Prices.

AFLOAT BY CARGO PER TON OF 2,240 LB.

Lump and Steamboat	$3 40	Stove	$3 65
Broken	3 25	Chestnut	3 40
Egg	3 30		

In cars in dealers' yards or on switch, 15c. per ton additional.

Lykens Valley Red Ash.

AFLOAT BY CARGO.		BY RAIL IN CARS.	
Broken	$3 98	Broken	$4 15
Egg	4 13	Egg	4 30
Stove	4 13	Stove	4 30
Chestnut	3 36	Chestnut	3 80

From wharf or yard to the trade, 50c. per ton additional.

Bituminous.

George's Creek, f. o. b. at Locust Point	$3 50 to $3 60		
Clearfield, " Canton	3 30 to 3 40		

Boston. May 5, 1877.

Coal is dull. Shipments this way continue large under the favorable ruling of freights. We quote freights $1 60 from Philadelphia, $1 30 from New York, $1 85 from Georgetown, and $2 from Baltimore. The prices below are figured on the basis of $2 75 free on board at Port Richmond for broken, $2 75 for egg, and $3 for stove. At New York the corresponding prices are $2 80, $2 80, and $3 15. Clearfield is selling at $2 90 f. o. b., with a $1 60 freight. Cumberland continues easy, and soft coals generally are quieter.

We quote Boston wholesale prices as follows:—

Anthracite, broken	$4 40@4 76	Cannel, English	$16 00
do. egg	4 40@4 75	do. Buckeye	10 00
do. stove	4 65	Lingan	4 75
Cumberland	5 00	Pictou	5 25
Clearfield	4 50	Penn	6 00
Westmoreland	5 00	Youghiogheny	5 00@6 00
Caledonia	4 50		

—Commercial Bulletin.

Cincinnati, O. May 8, 1877.

Specially reported by the Consolidated Coal and Mining Co.

The market for bituminous coal has ruled steady and firm for the past two months. There has been a boating stage of water for Youghiogheny and Kanawha River coals every few weeks, and the sales afloat have, for the most part, been made upon arrival of the tows from Pittsburg. The price has ruled firm upon each run at 7c. per bushel, net cash. Coal in barges from the coal harbors has sold in a small way at 7½c. cash. Kanawha River this season has sold uniformly at the same price as 2d pool Youghiogheny. Ohio River has been steady at 5¼c. and 5½c.. Anthracite circulars for May have been issued quoting prices here at $6.70 per ton on cars.

	AFLOAT. Per bush.	AFLOAT. per ton 2,000 lb.	DELIVERED. Per bush.	DELIVERED. per ton 2 000 lb.
Youghiogheny lump	7c.	$1 94	10c.	....
" nut	5½c.	1 53	9c.	....
" slack	4½c.	1 25	8c.	....
Camden, W. Va.	5½c.	1 53	9c.	....
Peytona Cannel	16c.	4 57	20c.	....
Connellsville coke	7c.	3 60	10c.	....
Youghiogheny coke	5c.	2 64	8c.	....
Crushed coke	....	....	10c.	....

Anthracite, Wilkes-Barre or Lehigh by car load $6 70
" " " delivered 8 00

Indianapolis, Ind. May 8, 1877

Specially reported by Messrs. COBB & BRANHAM.

Wholesale on board cars, and retail delivered to consumers.

BITUMINOUS.

White River, per ton	$ 2 50	Peytona Cannel, per ton.	$ 5 75
Brazil Block, "	2 25	Indiana Cannel	4 50
Highland, grate, "	2 00	Hocking Valley	4 25
Block coal, nut, per car.	18 00	Youghiogheny	4 50
Highland " "	18 00	Blossburg (smithing)	6 50
Block Slack "	17 00	Piedmont "	6 50
		Gas Cake, per bushel	10

ANTHRACITE (Lackawanna and Wilkes-Barre).

Broken	$7 60	Nut	$6 70
Egg	7 60	Stove	6 70

Lehigh Anthracite.

Broken	$7 60	Nut	$7 30
Egg	7 60	Stove	7 70

Retail, per bushel, delivered.

Sand Creek	13c.	Block Nut, steam	8c.
White River	13	" Slack, "	0
Brazil Block	13	Virginia Cannel	27
Highland Grate	11	Youghiogheny	16
Block Nut, domestic use.	11	Blossburg	26
Highland Nut, " "	11	Piedmont	26
" " steam	8		

GAS COKE (measured.)

Crushed	14c.	Lump	12c.

ANTHRACITE.

Wilkes-Barre and Lackawanna (all sizes)	$7 50 per ton.
Lehigh, retail	8 50 per ton.

New Orleans, La. May 5, 1877.

Specially reported by Messrs. C. A. MILTENBERGER & Co.

PITTSBURG COAL.

At wholesale (by boat load)	35c.	per bbl.
To steamboats	45c.	"
" manufactories	50c.	"
" families	75c.	"
In hhds. (for shipment)	$6 50	per hhd.

ANTHRACITE COAL.

At wholesale (per ton)	$6 00 to 7 00	per ton,
" retail	11 00	"

VIRGINIA CANNEL COAL.

At retail	$1 25	per bbl.

ST. BERNARD (KY.) COAL.

To steamboats	40c.	"
" families	70c.	"

Richmond, Va. May 10, 1877.

Specially reported by S. H. HAWES, Dealer in Coal.

Per ton of 2,240 lb., f. o. b.

Kanawha Cannel	$9 00	New River Bituminous	$3 60
Coalburg Splint	5 70	Clover Hill Coal	3 00
Lewiston "	5 70	James River Bitum	3 50
Kanawha Gas Coal	4 90	" " Carbonite	5 25

San Francisco, Cal.

From the *Commercial Herald* of May 3, 1877.

COAL—Imports from January 1st to April 16th :

	Tons.		Tons.
Anthracite	8,796	Mt. Diablo, 3 mos.	15,060
Australian	17,534	Vancouver Island	20,798
Coos Bay	10,114	Rocky Mountain	43
Cumberland	4,222	Seattle	33,195
English	34,057	Bellingham Bay	3,800
Chile	1,704		

The Government authorities resident at Victoria, B. C., have taken measures to drive out the malcontented strikers at the Wellington mines, hoping thereby to secure operatives that will work at the lessened rate of wages made imperative by the great decline in Coal here and elsewhere. Supplies of nearly all descriptions are very liberal, causing low prices to prevail as for a long time past. The only inquiry is for the better kinds of Australian, which are in lessened stock and with few cargoes to arrive. Some invoices of Coke have recently been sold to arrive at very low prices. Our quotations must be looked upon as entirely nominal. The Nanaimo mines are producing freely Bellingham Bay, Coos Bay, Black Diamond, and Mt. Diablo Coals arrive freely, all selling at low prices from the wharf, say for cargo lots $7.50@$8. Vancouver Island Coals, $8@$9 by the cargo ; Scotch and English Steam, $7.50@$8 ; Australian cargoes to arrive, $9@$9.25.

Toledo, Ohio. May 8, 1877.

Specially reported by Messrs. GOSLINE & BARBOUR.

There is no change in prices of coal at Toledo to note.

Ton of 2,000 lb.

Straitsville lump	$2 75	Hocking Valley nut	2 35
" nut	2 35	Massillon lump	3 00
Shawnee lump	2 75	Cumberland	5 50
" nut	2 35	Blossburg	5 50
Hocking Valley lump	2 75		

	Grate.	Egg.	Stove.	Chestnut.
Pittston	$6 00	$6 10	$6 60	$6 35
Wilkes-Barre	6 00	6 10	6 60	6 35
Lackawanna	6.00	6 10	6 60	6 35
Lehigh	6 75	6 85	7 35	7 10

For retail delivery, from 50c to $1 per ton in addition to above prices is charged.

Prices soft coal f. o. b. vessel for Lake shipments will be from 15 to 20c. per ton more than prices on cars.

Towing.

For rates of towing we refer to our issue of April 28.

Freights

Representing the latest actual charters up to May 10.

Per ton of 2240 lb.

PORTS.	From Philadelphia.	From Baltimore.	From Georgetown.	From Elizabethport, Port Johnson, South Amboy, Hoboken and Weehawken.
Augusta, Me.	....	....	....	....
Albany	....	1 65	....	....
Alexandria	*....	....	....	....
Annapolis, Md.	....	....	....	....
Bangor, Me.	1 75	1 80	....	1.15-1.25
Bath, Me.	1 60	1 75	....	1.15-1.25
Baltimore	65	....	....	....
Boston, Mass.	....	1 75	1 90	1.20-1.10
Bridgeport, Ct.	....	1 50	1 65	50
Bristol, R. I.	....	....	....	80
Beverly, Mass.	156@163	....	....	1 30
Cambridgeport, Mass.	1 60	....	....	1 25§
Charleston, S. C.	115@120	....	....	....
Danversport, Mass.	1 60	....	....	....
East Greenwich, R. I.	....	....	....	....
Fredericksburg, Va.	....	....	....	....
Fall River	....	1 50	1 65	80
Gloucester	1 70	.. ..	....	....
Greenport, N. Y.	....	....	....	....
Hartford, Conn.	....	2 00	....	....
Hoboken	....	....	1 40	35
Hudson	....	1 60	....	....
Jersey City	....	....	1 40	35
Lynn, Mass.	1 60	....	....	1 30†
Middletown	....	....	....	90
Marblehead, Mass.	....	....	....	....
Nantucket, Mass.	1 60	....	....	....
New Bedford	130@135	1 50	1 70	85
Newburyport	....	1 80	....	1 40
New Haven	....	1 50	1 65	50
New London	....	1 50	1 65	65@7
Newport	....	....	....	80
New York	80@90	1 30	1 50	35
Norfolk	....	....	....	75
Norwalk	....	1 50	....	50
Norwich	....	1 00	....	....
Pawtucket	1 40	1 65	....	90
Philadelphia	....	80	....	....
Portland	135@160	1 75	1 75	1 25
Portsmouth, N. H.	160@165	1 80	2 00	1 35
Providence	1 30	1 50	1 65	80
Poughkeepsie, N. Y.	....	....	....	....
Quincy Point, Mass.	....	....	....	....
Richmond, Va.	70@75	....	....	....
Salem, Mass.	....	1 75	....	1 25
Saco, Me.	....	....	....	....
Savannah Ga.	....	....	....	....
Somerset, Mass.	130@135	....	....	....
Stonington	....	....	....	75
Troy	....	1 65	....	....
Trenton, N.J.	....	1 00	....	....
Washington	85@90	....	....	....
Weymouth	1 65	....	....	....
Wilmington, Del.	....	80	....	....
Wareham	....	1 50	....	....

* And discharging and towing. † And discharging. ‡ And towing. § 3c. per bridge extra.

Rates of Transportation on Anthracite Coal to Tide Ports.

For the above freights we refer to our issue of April 28.

Genera, Ithaca and Sayre Railroad.—The rates of transportation on coal from Coxton, Pa., per ton of 2,240 lb., from and after the first of May, will be as follows :

To East Waverly, N. Y.	$1 75
" Ithaca for C. Lake RR. (local)	1 64
" " for C. Lake RR. and via Erie Canal (shipment)	1 25
" Van Etten, for U. I. and E. RR.	1 61
" Geneva (local)	1 62
" Geneva for S. P. and S. and L. O. S. Railroads, and for N. Y. C. and H. R. RR., except Auburn and Cayuga	1 62
To Geneva for Buffalo and Towawanda	1 49
" " " Genesee Docks	1 44
" " " Rochester and Charlotte	1 58
" " " Auburn and Cayuga	2 50
Total rate to Buffalo	2 46
" " " Roehester	2 22

REGULATIONS.

A charge of fifteen cents per ton will be collected of each consignee on all coal not unloaded within twenty-four hours after its arrival, and an additional charge

of ten conts per ton for every twenty-four hours thereafser ; Sundays and legal holidays excepted.

No allowance will be made for coal lost from cars on account of broken doors or other defects existing when the cars are loaded.

Seventeen cents per ton will be charged, at Ithaca Docks, for shipping coal direct from cars to vessels, and 12 cents per ton additional from stock, making a total charge on what is shipped from stock of 29 cents per ton.

All freights will be collected weekly, by drafts on shippers, from Coxton to destination.

IRON MARKET REVIEW.

New York.

FRIDAY EVENING, May 11, 1877.

American Pig.—The Thomas Iron Company reports sales of about 500 tons on the basis of $19 for No. 1 foundry. There has been for more than a week a rumor that the Glendon Iron Company has sold from 15,000 to 20,000 tons of forge iron. This, however, is not fully credited. Prices are very much demoralized, and large lots could only be disposed of at concessions. We quote No. 1 foundry at $18 50@$19; No. 2 foundry at $17 50@$18; and forge $17@$17 50.

Scotch Pig.—The business doing in this article is very small, as must be expected, with the prices of Scotch iron advancing, while American are declining. We quote Eglinton at $25 50; Glengarnock, $27@$27 50; and Coltness, $28.50@$29.

Rails.—There is a rumor that some business has been done in steel rails, the particulars of which we failed to learn. The market is generally quiet. We quote steel rails at mills at $46@$50, and iron at $33@37.

Old Rails.—In the absence of business we qoote nominally at $19.

Scrap.—No. 1 wrought is quiet and nominal at $25.

Baltimore, Md. May 9, 1877.

Specially reported by Messrs. R. C. HOFFMAN & Co.

We have to report continued dullness in the iron market. The demand is light, and the business generally very quiet. We quote prices as follows :

Baltimore Charcoal	$29@31	Mottled and White	$16@17 00
Virginia Charcoal	28@32	Charcoal C B. Blooms	58@60 00
Anthracite No. 1	21@22	" " Billetts.	63@65 00
" " 2	20@21	Refined Blooms	43@45 00
Anthracite No. 3	19@20	Scrap Blooms	43@45 00

Boston. May 5, 1877.

Pig continues depressed, with no demand at all for future delivery, and a very small inquiry for spot lots. We quote $23.50@25 for No. 1, $23 for No. 2, and $22@23 for gray forge. Scotch pig is firmer. We quote $27@30 for store lots, these being the best figures that could be actually obtained. The foreign markets are cabled higher.

Bar is dull, quoting $47@48 for refined, and $38@39 for common. Nails are in light demand at the reduction.—*Commercial Bulletin.*

Cincinnati, O. May 7. 1877.

Specially reported by Messrs. TRABER & AUBERY, commission merchants for the sale of pig iron, blooms, ore, etc.

CHARCOAL.

Hanging Rock No. 1 Foundry	$25 00@	—4 mos
" " 2 "	23 00@24 00	—4 mos
" Soft Silver Gray	22 00@23 00	—4 mos
" Mill	21 00@22 00	—4 mos
Tennessee, No. 1 Foundry	23 00@23 50	—4 mos
" " 2 "	22 50@	—4 mos
" Mill,	21 00@21 50	—4 mos

STONE COAL.

Ohio, No. 1 Foundry	22 50@23 00	—4 mos
" " 2 "	21 50@22 00	—4 mos
" Soft Silver Gray	21 00@21 50	—4 mos
" Mill	20 50@21 00	—4 mos

COKE.

Ohio & W. Va. No. 1 Foundry	25 00@	—4 mos
" " 2 "	23 00@24 00	—4 mos
" " Mill	21 50@22 00	—4 mos

CAR-WHEEL.

Hanging Rock, C. B	38 00@43 00	—4 mos
Tennessee, "	28 00@32 00	—4 mos
Missouri, "	30 00@33 00	—4 mos
Alabama, "	28 00@32 00	—4 mos

BLOOMS.

Charcoal	55 00@60 00	—cash.

SCRAP IRON.

Cast	50c.@ 1 00	"
Wrought	1 00@ 1 40	"

Cleveland, O. May 7, 1877.

Specially reported by Messrs. C. E. BINGHAM & Co.

Per gross ton, on four months' time. Subject to change in market. Discount for cash 4 per cent.

FOUNDRY IRON.

No. 1, L. S. Charcoal	$25 50	Am. S., No. 1, Ch. Val.	24 00
No. 2, " " "	25 00	" " B—1, " "	23 00
No. 1, Anthracite	23 00	" " No. 2, " "	22 00
No. 2, "	22 00	No. 1, Massillon	24 00
No. 1, Bituminous	24 00	B—1, "	23 00
No. 2, "	22 00	No. 2, "	21 00

CAR WHEEL AND MALLEABLE IRON.

No. 3 L. S. Charcoal	26 00	No. 5 & 6, L. S. Charcoal	$26 00
No. 4, " " "	26 00		

BESSEMER IRON.

Nos. 1 & 2, L. S. Char.	$25 00

FORGE IRON.

No. 1, Gray	$20 00	White and Mottled	$19 00

Louisville, Ky. May 8, 1877.

Specially reported by Messrs. GEORGE H. HULL & Co.

There is no perceptible change of feeling in this market. Buyers are not inclined to purchase for future consumption unless at a bargain. The usual time—four months—is allowed on quotations below.

FOUNDRY IRONS.

No. 1 Hanging Rock, Charcoal	$24 00@25 00
No. 2 " " "	22 00@23 00
No. 1 Southern Charcoal	22 00@ ....
No. 2 " "	20 50@21 00
No. 1 Hanging Rock, Stonecoal and Coke	23 00@24 00
No. 2 " " " " "	21 00@22 00
No. 1 Southern Stonecoal and Coke	21 00@21 50
No. 2 " " " "	20 50@21 00
"American Scotch"	23 00@23 50
Silver Gray	19 00@21 00

MILL IRONS.

No. 1 Charcoal, Cold-short and Neutral	20 00@21 00
No. 1 Stonecoal and Coke, Cold-short and Neutral	19 50@20 50
No. 2 " " " " "	19 00@19 50
No. 1 Missouri and Indiana Red-short	24 00@24 50
White and Mottled, Cold-short and Neutral	16 00@17 00

CAR-WHEEL AND MALLEABLE IRON.

Hanging Rock, and Cold Blast	37 00@40 00
Alabama and Georgia "	28 00@35 00
Kentucky Cold-blast	28 00@40 00

Montreal. May 11, 877.

There have been a few medium-sized lots of Pig Iron sold, but by last accounts prices seem to have advanced in England, which will tend to stiffen prices here. We quote: Pig Iron—Gartsherrie, $21.00 to 21.50; Summerlee, $20.00 to 20.50; Eglinton and Clyde, $19.00 to 19.50; Hematite, $26.00 to 27.00; Glengarnock, $19.50 to 20; Coltness, $22 to 22.50. Bars—Scotch and Staffordshire, $1.90 to 2.00; best do. $2.15 to 2.25; Swedes and Norway, $4.50 to 5.50; Lowmoor and Bowling, $6.00 to 6.50.—*Monetary Times.*

Pittsburgh, Pa. May 8, 1877.

Specially reported by A. H. CHILDS.

The demand for pig iron in this market is hardly as active as heretofore, as several of the mills have shut down their puddling furnaces, and some of the others are working only part time. As nearly all have for some time past been pursuing the policy of buying only as the metal was actually needed, any stoppages are immediately felt in the decreased demand. Quotations are :

	4 mos.		4 mos.
No. 1 F'dry	$22 00@24 00	Mottled & White	$17 50@20 00
" 2 "	21 00@22 00	Hot blast C'coal	21 00@28 00
Gray Forge	19 00@22 00	Cold " Western	40 00@45 00

Philadelphia, Pa.

[Weekly Report of the Philadelphia Iron Market, furnished for THE ENGINEERING AND MINING JOURNAL, by JUSTICE COX, Jr., & Co., Iron Manufacturers, 333 Walnut Street, Philadelphia. Week ending May 10, 1877].

PIG IRON—The pig iron market is devoid of any new feature of special interest; we hear but one story, the dull trade and low prices; yet, as we remarked in our last, the furnace companies are piling but little iron at this time, and stocks all over the country are lighter. We report the usual amount of iron sold from week to week, viz., 2,000 to 3,000 tons at full quoted prices. We quote No. 1, $19.50 to $20.50; No. 2, $17.50 to $18.50; Gray Forge, the scarcest thing in the market, is quoted $17 to $19.50, according to brand.

MANUFACTURED IRON—The demand for manufactured bars continues dull and low prices ruling throughout, no large orders can be taken at any price as several of the Western mills have found by offering low prices for large lots for cash without takers the dealers and consumers preferring to buy as they want and pay as they can.

TANK, PLATE, AND SKELP are also dull with terribly low prices ruling. We quote bars 2 to 2·10c. per lb.. Tank and Plate 2½ to 7c. per lb. Skelp 2¼ to 2¼c. per lb.

RAILS—The demand for steel rails continues, though prices are quoted weaker, as some of the mills want orders. There is some demand for new rails, but low prices are offered. We quote steel, $48 to $50 ; iron, $35 to $39.

OLD RAILS—The demand for old rails is good but low prices are ruling. We quote $20 to $21.

OLD WHEELS are in plentiful supply and low prices ruling. We quote $17 to $19.

SCRAP—Wrought is quoted at $24 to $26; cast, $14 to $19.

Richmond, Va. May 7. 1877.

Specially reported by ASA SNYDER, Esq.

Beyond the blowing in of a charcoal furnace in South West Virginia there is no item of intereet under this head to communicate. While prices are unchanged, sales are merely nominal.

Virginia Cold Blast Charcoal Pig Iron			$27 to $33
" Warm " " "			24 to 28
" " " Coke	" "	1 X	23 to 24
" " " "	" "	2 X	21 to 22
" " " "	" "	3	20 to 21
" Anthracite 1 X			— to —
" " 2 X			— to —
" " 3			— to —

St. Louis, Mo. May 8, 1877.

Our market remains very quiet. The demand continues light and prices unchanged. We quote same as last week.

Specially reported by Messrs SPOONER & COLLINS, Commission Agents for all kinds of Iron.

COLD BLAST CHARCOAL—ALL NUMBERS.

Hanging Rock	25@40	Assorted Bar Iron	$2 10, rates.
Tennessee	28@30	No. 1 Wrought Scrap	80c. cwt.
Kentucky	28@30	Heavy cast "	65 "
Missouri	28@30	Light " "	35 "
Georgia	28@30	Old rails	20 50 to 21 00
Alabama	28@30	Old car wheels	18 00 to 19 00

	No. 1.	No. 2.	Mill.	White and Mottl'd.
Missouri stone coal	$25 00	$23 00	$22 00	$21 00
" charcoal	23 00	22 50	22 00	20 00
Tennessee charcoal	23 00	22 50	22 00	20 00
Tenn. coke very soft and strong	25 00	23 00	22 00	20 00
Hanging Rock charcoal	26 00	24 50	23 50	.....
" " cold short	25 00	24 00	.....	.....
	Ex No. 1	No. 1.	B No. 1.	No. 2.
Alice Hanging Rock coke	$25 50	$25 00	$24 50	$23 00
Quinnimount, W. Va., coke	25 00	24 00	23 50	22 50

METALS.

NEW YORK, FRIDAY EVENING, May 11, 1877.

The metal market has been very quiet in all articles with no encouraging features.

Gold Coin.—During the week under review the price of gold has ranged from 106⅞ to 107½, and closed at 107.

Bullion.—In consequence of an advance in India exchange the price of silver steadily held the upward course until yesterday, when it reached 54⅜d., declining to-day to 54½d. Our quotation is 119 per ounce, while San Francisco quotes at 8⅛ per cent. discount. Gold bars are quoted at ⅛@¼ per cent. premium.

Copper.—The sales during the week under review have aggregated about 300,000 lb. at 19@19¼c., closing at 19⅛c. The manufacturers are reported to be quite busy, although they still purchase from hand-to-mouth. Chili Bars are quoted at £68, in London, and Best Selected, £76.

Tin.—Straits in London is quoted at £70 10/. The quotations here are as follows, in gold, per lb.: Straits, 16½@16⅝c.; L. & F., 16@16⅛c.; Refined, on spot, 16½@16⅝c., and to arrive, 16⅜c.; Banca, 18⅛c. We note a sale of from 20 to 25 tons of Straits, to arrive, at 16¼c. The market is generally quiet.

Tin Plates.—A fair jobbing business is doing in these. We quote in gold, per box, as follows: Charcoal tins, $6.62½@6.75, and ternes, $5.87½@6; coke tins, $5.75, and ternes, $5.25@5.37½.

Messrs. Robert Crooks & Co., of Liverpool, under date of April 26, says of Tin Plates.—"Taken as a whole, the market shows no improvement, though a few favorite brands of Charcoal Tins and Ternes have been bought freely during the last day or two. In ordinary Coke and Charcoal Tins the choice of brands at the lowest prices is considerably increased. and the competition arising from this will, in default of improvement in demand, force makers to accept even lower rates."

Lead.—We only note a sale of 100 tons of ordinary lead at 5.80c., with small sales at 5.85c. The market continues weak with 5¾c. as the price for large lots.

Spelter and Zinc.—There is but little doing in spelter, which continues to be quoted at 6¼@6¼c. Sheet zinc remains as it has been at 7⅝@7½c., currency.

Antimony is in liberal demand, and is somewhat firmer, being quoted at 11⅞c,, gold.

Quicksilver. London quotes at £7 10/ per flask, and San Francisco, 42c. per lb.

The San Francisco *Commercial Herald* of May 10 says of Quicksilver: "The average monthly supplies promise to exceed 5,000 flasks for some time to come, or fully up to the export requirements. Of late there has been some slight stock accumulation, chiefly speculative. Buyers will stock up at 40c. The present asking price is 41½@42c., but buyers offer only 41c. At the close sales in lots of 1,000 flasks for export at 41½c.

Our monthly receipts of this article compare with 1876 as follows:

	1876		1877	
MONTH.	Bay, flasks.	Coast, flasks.	Bay, flasks.	Coast, flasks.
January	3,877	281	5,087	327
February	3,864	62	7,118	183
March	3,762	154	5,032	409
April	4,313	317	5,882	233
Totals	15,816	814	23,119	1,152

Our exports by sea for April, 1876-7, were as follows:

	1876		1877	
To	Flasks.	Value.	Flasks.	Value.
China	600	$25,936	2,773	$89,419
Mexico	349	16,019	1,295	40,738
Australia	40	1,803	110	3,471
South America	100	4,590	300	9,926
Japan	25	1,147	40	1,403
New Zealand	30	1,328	50	1,568
Victoria	4	182	1	34
Totals	1,148	$51,005	4,569	$146,559

FINANCIAL.

New York Stocks.

NEW YORK, FRIDAY EVENING, May 11, 1877.

The aggregate of sales for the week show a falling off. The coal shares in sympathy with the balance of the list, were held very firm during the early portion of the week, and only began to decline upon the announcement that another coal combination meeting had taken place without accomplishing anything, and that the Delaware & Hudson Canal Co., had issued a circular withdrawing its previous price list, and reducing its quotations, which was considered a forerunner of a war in the coal trade. The sales of Delaware, Lackawanna & Western have amounted to, 159,770 shares, the prices ranging from 52⅞ to 44⅞ closing at the latter figure.

The sales of Delaware and Hudson have been larger than last week, amounting to 33,036 shares. The price of this stock, however, has been steadily tending downward, the vote of approval of the management by the stockholders to the contrary notwithstanding. The range for the week has been 48¼@41, closing at the latter figure. The sales of New Jersey Central only aggregate 738 shares at 8@8¾.

In the suit of the Lehigh Coal and Navigation Company, the United States Circuit Court on May 4th made an order remanding the case to the Court of Chancery, of New Jersey. It is said, however, that this order does not affect the petition for the surrender of the Lehigh & Susquehanna road, in default of payment of rental, which is still undecided.

Cleveland Iron Mining Company.—The annual meeting of this company will be held in Cleveland, O., on the 16th inst.

Miscellaneous Sales and Quotations.

Sales and quotations of the stocks and bonds dealt in here and at Philadelphia, for the week ending the 11th inst. are given in the following tables. The Philadelphia quotations will have a * affixed.

STOCKS.

	Quotations. Highest.	Lowest.	Closing.	Sales Shares.
American Coal Co	—	—	32½	—
*Cambria Iron Co	—	—	60	91
*Pennsylvania Salt Manf'g Co.	—	—	70*	—
*Westmoreland Coal Co	79	77¼	77¼	1⅗
*Buck Mountain Coal Co	—	—	40*	—
*Schuylkill Nav. Co	—	—	—	—
St. Louis, I. M. & S. RR. Co	5	4⅞	5	2,187
Spring Mountain Coal Co	—	—	65*	—

BONDS.

D., L. & W. 7s, Convt., 1892	J. & D.	—	—	103½	—
" " 2d mtge., 1881	M. & S.	—	—	107	—
N. J. C., 1st mtge., new	F. & A.	109	108	108	38,000
" " 1st mt., cons. 1893	Q.	55⅝	55	55¼	41,000
" " Convt	M. & N.	51½	—	51½	4,000
L. & W. B. Coal Co., cons.	Q.	29½	28¾	28½	12,000
Am. Dock & Imp. 7s	J. & J	—	—	50	—
D. & H. C. Co., 1st m., 1884	J. & J.	97¾	—	96½	1,000
" " " " 1891	J. & J.	98⅝	—	97⅛	30,000
" " " " " 1877	J. & J.	98	95	98	11,000
" " " " reg., 1894	A. & O.	—	—	88	—
" " " " coup., 1894	A. & O.	—	—	89	—
St. L. I. M. & S., 1st mt. 1892	F. & A.	97	—	97	5,000
Ches. & Ohio, 1st mt., 1899	—	22	—	20	1,000
*L. V. RR., con. m. 6s, 1923	J. & D.	93½	93¼	93⅛	17,000
" " 2d m., 7s, 1910	M. & S.	107½	—	107½	3,000
" " reg., 1898	J. & D.	—	—	107	—
" " coup., 1898	J. & D.	106¾	—	106½	8,000
*P. RR., 1st mtge., 1880	J. & J.	105¾	105	105½	2,000
" Gen. mtge. reg., 1910	A. & O.	—	—	104¼	—
" Con. m. 6s, con., 1905	J. & D.	93½	—	93½	2,000
" " " reg. 1905	Q.	—	—	93½	—
" gen. M. Coup., 1910	J. & J.	107	—	107	4,000
*P. & R. RR., 7s, 1893	A. & O.	106	—	—	2,000
" " con. m. 7s, con. 1911	J. & D.	95¼	—	95	8,000
" " Deb. 6s, 1893	J. & J.	39	—	38	1,000
" " New convt. 7s, 1893	J. & J.	50	49	50	15,000
" " Con. mtge. 7s, reg.	J. & D.	95½	95	93½	11,000
" " 6s, 44-80	J. & D.	102½	—	103	1,000
*P. & R. C. & I. Co. Deb. 7s	M. & S.	—	—	—	—
*P. & R. C. & I. Co	—	—	—	—	—
*L. C. & N. Co. 6s, 1884	M. & Q.	—	—	—	—
" " RR. loan 1897	F. & Q.	99	—	99	1,100
" " Con. mtge. 7s,	J. & D.	—	—	—	—
" " Cvt. gold, 1894	M. & S.	—	—	—	—
" " Gold Loan, 1897	J. & D.	86¾	—	86¾	17,020
*Schuylkill Nav., 6s, 1897	M. & Q.	57¼	86	58	1,600
*Pa. and N. Y. Canal, 7s	J. & D.	107¾	—	107	15,000
*Pa. Canal Co	J. & J.	65	107	65	8,000
*Susquehanna Coal Co. 6s.	—	—	—	—	—

Total transactions for the week.....$259,700

Philadelphia Stocks.

PHILADELPHIA, FRIDAY EVENING, May 11, 1877.

There has been but a very limited business done in the stocks on this market. The closing quotations are lower all around. The Standard Oil Company is reported to be doing a business of 150 cars per day over the Philadelphia & Reading Railroad, the outgrowth of a misunderstanding with the Pennsylvania Railroad.

Reports are current that the Lehigh Valley Railroad Company is preparing to follow the example of the Reading, and require its engineers to leave the Brotherhood. The officers are said to be preparing a plan for a life insurance fund for the employes of the road.

Salt Lake Ore and Metal Market.

The prices given below were received by telegraph to-day, the 11th inst. The market is very weak though no lower prices are given than those quoted below.

Argentiferous Lead (Base Bullion).—$74 per ton for lead. $1.20 per ounce for silver. $20 per ounce for gold. The quotations for silver are based upon the silver contents in the lead of 70 ounces per ton of 2,000 lb.

The *Tribune* of the 5th inst., gives the following as the bullion output of the Territory for the month of April: Base bullion 2,275 tons at $200.....$455,000 00
Silver-Lead ore 65 tons at $100..... 125,000 00
Copper ore 1,250 tons at $100..... 6,500 00
Silver bullion from the Ontario district.... 98,994 00
Silver bullion from the Tintic district..... 45,000 00
Silver bullion from the Leeds district..... 56,000 00
Gold bullion from the Tintic district..... 10,000 00
Gold bullion from the Bingham district.... 4,800 00

$801,000 00

During the month 10 tons of San Pete coke, 896 tons of Pennsylvania coke and 733 tons of charcoal were shipped to the Sandy Smelting works.

Of the 2,275 tons of bullion shipped abroad during the month, the Smelting works of Salt Lake County, produced 1,057 tons, Beaver County 54 tons, and Tooele 200 tons. We have, in the same time imported from Nevada 296 tons of fine dust and 18 tons of Idaho ore.

Bingham sent to market, over the Bingham Canyon Railroad, 3,684 tons, and by team, 490 tons, making a total of 4,174 tons of ore for the month.

The Cottonwoods sent 3,721 tons of ore to market over the Wasatch and Jordan Valley Road, and 150 tons from Big Cottonwood by team, or a total of 3,871 tons.

The Pioneer Sampling Mill, at Sandy, is sampling 15 tons of ore daily, representing 60 tons. This mill employes 16 men.

The *Inter-Ocean* correspondent, under date of the 3d inst., says: "The Utah Southern Railroad is financially and in every other respect a great success, and its future prospects most flattering. Some idea may be formed of the business done by this road from the amount of ore transported over it for the present year, which is as follows: For the month of January, 13,046,742 lb.; for the month of February, 14,676,869 lbs.; for the month of March, 7,567,684 lb.; for the month of April, 6,830,870. Total, 42,122,165 lb. The soft condition of the wagon roads affected the supply of ore, being equal in March and April to the other months. The mines are in a measure dependent upon good roads for timber and other supplies, which, when the mines are any distance from the railroad, seriously affects it.

The Bingham Canon Railroad, some twenty miles in length, connecting the Bingham Canon mines with many of our largest smelting works, is a very prosperous road.

Copper Stocks.

Reported by Wilson W. Fay & Co., Bankers and Brokers Room 7, Traveler Building, 31 State Street.

BOSTON, THURSDAY EVENING, May 10, 1877.

The market closed very dull and, in the main, weak. Allouez has appeared on the boards again this week, and sold at $8, closing $7¼ bid, and $8 asked. Calumet a little off, at $180 against $181½ one week ago. There is a strong demand for Central, and as high as 38 has been bid, but as yet no stock has come out. Copper Falls is slightly weaker at 2 bid. The Company sell on May 31 some 900 shares of the stock for the non-payment of the assessment of $2 per share, due May 25, 1876. This stock will probably sell readily for the assessment. Duncan has been the weakest point in the market this week, selling from 4¼ down to 2¾. Rumors have been thick as to the cause, but we can get nothing that is authentic. At one time they had the mine abandoned, another that they had struck the vein again, but as far as we can see not much stock is taken in either of them. The mine undoubtedly is not looking as well as it was some time ago, and, above all, there are no orders to buy from the outside public, and the managers do not come in and support it. They have also had a small fire at the mine, causing a loss of a few hundred dollars. International, in sympathy with Duncan, has declined to 25. In the others there is nothing new calling for comment.

Gold and Silver Stocks.

NEW YORK, FRIDAY EVENING, May 11, 1877.

The business of the week shows an improvement over the previous one, the sales aggregating 58,512 shares. Seaton has been the feature of the market, ranging from 4¼ @ 4¾ during the early portion of the week, and on Wednesday afternoon declining to $3. On Thursday it became known that Mr. A. W. Whitney, the leading operator in this stock, was embarrassed and had disappeared, after which the stock still further receded, reaching 2⅛, and ranging since then between that figure and 3¼, closing at 2¾. The sales have aggregated for the week 9,400 shares. Considerable business has been done in the Comstock mines, but with these exceptions the market has had no features.

We condense the following from the *Gold Hill News* of May 2: "The California mine is yielding 500 tons of ore per day. The April bullion yield will be sufficient to pay the dividend of $2 per share. The Consolidated Virginia mine is producing 400 tons of ore per day, the mine looking well at every point. The C. & C. shaft has reached the 1,750-feet level, the bottom in hard blasting rock. The daily yield of the Belcher mine is 80 tons, keeping the Santiago mill steadily crushing. The April bullion yield is amply sufficient to pay the entire running expenses of the company. The Yellow Jacket Mining Company, owing to the stringency of the times, has discharged a number of its men from the old works, retaining only sufficient force to sink the new shaft, which will be pushed ahead with activity, and inside of sixty days powerful machinery will be brought into operation at that point, sufficient to sink to the depth of 2,500 feet, connecting with the present lowest workings of the old mine. The Crown Point mine continues to be troubled with water. A recent strike in the mine consisted of the tapping of a strong flow of scalding water in the east drift on the 2,000-feet level by the diamond drill. The daily yield of the Justice is 400 tons of ore, keeping the mills steadily running. $163,450 in bullion was sent down on April account. Ophir is yielding 30 tons tons of ore per day. Chollar-Potosi is turning out 100 tons of ore per day, assaying $25 per ton. The east drift on the 2,000-feet level of the Imperial mine is in favorable ledge matter. This company insists on ten hours as a day's work below the surface, and require the men working on top to put in twelve hours. The Sutro Tunnel is in 16,677 feet. The face of header is in ledge porphyry, with streaks of clay and quartz. This material drills and works very unfavorably, rendering progress slower than usual at present."

The Consolidated Virginia Mining Company has declared a dividend of $2 per share, payable on the 15th inst. the first since last December.

The California Mining Company has declared a dividend of $2 per share, payable on the 15th inst.

The Bank of California.—750 shares of the stock of this institution were recently sold at $885 per share, said to be a peremptory sale for account of Senator J. P. Jones.

San Francisco Stock Board.—Seats in this board, it is said, have declined to $15,000. Two years ago they sold as high as $35,000, and buyers thought they were fortunate in getting them at that price.

Ontario Silver Mining Company of Utah.—The New York Stock Exchange has placed the stock of this company upon its free list. This Company has just declared its regular monthly dividend of 50c. per share, equal to $50,000.

We glean the following from our exchanges published near the respective mines:

The Keystone Gold Mine in Amador County, Cal., is producing bullion at the rate of about $40,000 per month. The monthly disbursements of this Company for labor amount to about $12,000.

The Tybo Consolidated Mine is shipping bullion at the rate of $90,000 per month, having sent down $84,356 on April account to the 26th ult.

The Dan Tucker Silver Mine is located about twelve miles from Helena, Montana. Thirty tons of ore recently extracted from the mine assays $600 per ton.

The Eureka Gold Mine of Grass Valley, Cal., has declared a dividend of $2 per share, aggregating $40,000. Up to December, 1873, since which time no dividend has been declared, this Company paid $2,054,000 to its stockholders.

The North Fork Gold Mining Company, located at Forest City, Sierra County, Cal., have made a rich strike. The Company was engaged in running a tunnel in the bed rock, so as to strike the bottom of a large gravel deposit, when a quartz ledge about three feet was cut. The ledge does not crop out, but the point at which it is cut if about four hundred feet below the surface of the ground. The region where this strike has been made is rather celebrated for having no surface quartz.

The Spenceville Copper Works, located in Wheatland, Yuba County, California, reduce about 30 tons of ore per day, producing about two tons of 80 to 90 per cent. matte copper, equal to a weekly product of about $4,000.

The Bald Mountain Gold Mining Company, located at Forest City, California, employ 300 men. The mines worked by this company promise well, but the scarcity of water this year will interfere with their development.

The Spanish Gold Mines, located in Grant County, Oregon, furnish employment for about 40 miners. The gold yield this year, it is ant'cipated will reach $50,000.

The Manhattan Silver Mine, of Austin, Nevada, shipped during the month of April 98 bars of bullion, valued at $100,075 25.

The Father De Smet Mill, located at Deadwood, Dakota, cleaned up on the 27th ult., obtaining a large yield. Information from the Black Hills mines, dated the 29th ult., state that the gulches were overflowing, and consequently placer mining was largely suspended. The quartz mills are running day and night, with large returns. Cold weather had retarded prospecting, and few new discoveries have been made.

The Burnt River Gold Mines, located in Baker County, Oregon, yields large quantities of ore, which ranges from $10 to $43 per ton. The placer mines located here are said to pay $10 per day to the man.

NEW YORK MINING STOCK EXCHANGE.

The sales for the week amount to 17,494 shares, as against 11,800 shares reported in our last, with prices in gold and silver stocks about the same.

A very large business has been done in copper stocks, which are becoming a prominent feature in this Board Allouez has advanced $1, Atlantic $1⅛, and Mesnard 25c., the assessment having been paid. In fact the whole list has advanced with the exception of National, which is down to 12½c. per share, and Franklin which has declined $3½ per share.

Sales.

Allouez	100	shares	@$7
Atlantic	3,701	"	@$7¼@8½
Calumet & Hecla	12	"	@ $181
Central	681	"	@ $40
Mesnard	100	"	@7½c.
National	1,000	"	@25@50c.
Pewabic	200	"	@$3

Closing Quotations.

	Bid.	Asked.		Bid.	Asked.
Allouez	6	....	Mesnard	62½	1 00
Atlantic	7 75	8 50	National	12½	37½
Cal'tHecla	180 00	182 00	Osceola	20 00	.....
Central	39 00	42 00	Pewabic	2 00	3 00
Franklin	8 00	11 00	Quincy	....	40 00
Madison	20	30	Ridge	3 37½	3 75

COAL TRANSPORTATION AND GENERAL MINING STOCKS.

Name and Location of Company.		Feet on Vein.	Capital Stock	Shares. No.	Shares. Par Val.	Assessments. Total levied to date.	Assessments. Date and amount per share of last.	Dividends. Total paid to date.	Dividends. Last Dividend.	Dividends. Rate per Ann.	May 5. H.	May 5. L.	May 7. H.	May 7. L.	May 8. H.	May 8. L.	May 9. H.	May 9. L.	May 10. H.	May 10. L.	May 11. H.	May 11. L.	Sales.
Coal Stocks.			$			$		$		Pr.ct													
Consol. Coal	Md.	....	10,250,000	102,500	100	.. ..	.. ..	...	Jan., '77, 2½	10	..	..	..	..	..	..	..	..	..	..	..	..	....
Del. & H. Canal	Pa.	....	20,000,000	200,000	100	.....	.....	....	Aug., '76, 4	8	47¼	46¼	48¾	45⅝	46¼	45⅛	46	43¾	44⅞	43	44	41	33,036
Del., Lac. & W. RR.	Pa.	....	26,200,000	524,000	50	.....	.....	....	April, '76, 2½	10	51½	49¾	52⅜	49¾	50	48½	49¾	48⅞	48¾	47⅛	48¾	44⅞	190,770
Lehigh C. & N.	Pa.	....	10,448,550	208,971	50	.....	.....	....	Sep., '76, 1⅜	6	40	..	40⅜	40	40½	40	40¾	40	39½	38½	38	37½	9,890
Lehigh Valley RR.	Pa.	....	27,042,900	540,858	50	.....	.....	....	April, '77, 1½	6	72½	..	72¼	72	72	..	72	71	72	71	71½	70¾	3,180
Maryland Coal	Md.	....	4,600,000	44,000	100	.....	.....	...	Jan., '76, 1⅜	1½	10	..	10	..	10	..	10	..	..	..	..	..	600
N. J. Central RR.	Pa.	....	20,600,000	206,000	100	.....	....	....	April, '76, 2½	10	8¾	..	8½	8	..	..	8¾	8	8	..	8⅜	..	738
Penna. Coal	Pa.	....	5,000,000	100,000	50	.....	.....	....	Feb., '77, 5	20	..	..	..	..	..	..	..	..	..	..	..	..	....
Pennsylvania RR.	Pa.	....	68,868,700	1,377,376	50	.....	.....	....	Feb., '77, 2	8	71	70¼	72¼	70¼	70½	69¾	71	70¼	70¾	69¼	69¾	69½	56,343
Phil. & Read. RR.	Pa.	....	34,278,755	685,575	50	.....	.....	....	Jan., '76, 2½	10	25½	24¼	24¾	24¼	24¼	24½	24¾	24½	24½	24¼	24½	24	10,923
General Mining Stocks																							
Alpha Cons. G. S.	Nev.	300	3,000,000	30,000	100	180,000	Aug., '75, $1.	....	.....	..	12⅜	12⅛	11	..			..	..	6¾	6½	8¾	8½	1,800
Am. Flag, G.	Colo.	5,300	600,000	60,000	10	**	.....	....	.....	..	12c	11c	12c	11c			..	11c	..	..	..	..	2,490
Belcher, G. S.	Nev.	1,040	10,400,007	104,000	100	864,400	Feb., '77, $1.	15,397,200	April, '76, $1.	12	5⅜	..	5¾	..			4	..	4	3¾	3⅛	3	1,300
Bertha, G.	Vir.	645 acs.	300,000	30,000	10	**	.....	....	.....	..	6½	..											200
Best and Belcher, G. S.	Nev.	545	10,080,000	100,800	100	236,992	Feb., '77, $1.	....	.....	..	17½	..	15¾	..			13	..	12	11¾	12⅛	11¾	1,500
Bobtail, G.	Colo.	2,500	1,136,630	227,326	5	**	.....	....	.....	..	1.55	1.40	1.50	1.45			1.50	1.45	1.50	..	..	..	2,600
Bobtail Tunnel, G.	Colo.		100,000	20,000	5	6,000	July, '73, 30c.	20,000	Dec., '76,	..	..	..	..	..			..	..	..	..	..	..	....
Bullion, G. S.	Nev.	943½	10,000,000	100,000	100	2,402,000	April, '77, $2.	....	.....	..	2¼	..	2⅛	2			4½	..	3¼	3⅛	3⅝	3¼	1,310
Caledonia, G. S.	Nev.	2,188	10,000,000	100,000	100	1,310,000	Feb., '77, $1.	....	.....	..	2	..	..	..			2	..	..	1⅜	..	..	500
California, G. S.	Nev.	600	54,000,000	540,000	100	....	.....	12,960,000	April, '77, $2.	24	34¾	34	35	..			29⅝	29½	29½	29⅛	3⅝	30	1,900
Centennial, G.	Cal'f	66 acres	1,000,000	100,000	10	....	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Chollar Potosi, G. S.	Nev.	1,400	2,800,000	28,000	100	1,282,000	June, '76, $5.	3,080,000	Feb., '72, $1.	..	..	..	34	..			27½	..	21¾	21½	22⅛	21¾	1,425
Cleveland, G.	Colo.	3,715	250,000	25,000	10	**	.....	....	.....	..	7⅞	7	7	..			7	..	7⅞	7	7¾	7	3,200
Cons. Hercules & Roe.	Colo.	16,500	1,000,000	100,000	10	**	.....	120,000	.....	..	..	..	..	..			..	..	..	..	..	..	....
Cons. Imperial, G. S.	Nev.	468	50,000,000	500,000	100	375,000	March, '77, 25c.	....	.....	..	1⅜	1	1⅜	..			1⅜	..	1⅜	..	1¼	1⅛	1,700
Con. N. Slope & E. C. T.	Colo.	15,000	500,000	10,000	50	**	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Cons. Virginia, G. S.	Nev.	710	54,000,000	540,000	100	411,200	June, '73, $3.	25,920,000	Dec., '76, $2.	24	31⅝	..	34	..			..	..	29⅞	29½	31	30½	800
Confidence, G. S.	Nev.	130	2,496,000	24,960	100	243,840	March, '73, $1.	78,000	May, '65, $8.⅓.	..	3¼	..	..	..			3⅜	..	2¾	..	2½	..	430
Crown Point, G. S.	Nev.	600	10,000,000	100,000	100	1,373,370	Apr., '77, $1.	11,588,000	Jan., '75, $2.	..	6⅜	6¼	7	..			5⅝	5½	5	4¾	4⅞	4⅜	1,990
Douglas	Colo.	21,000	1,000,000	10,000	100	**	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Eureka Cons. G. S. L.	Nev.	..	5,000,000	50,000	100	100,000	May, '76, $1.	1,000,000	Aug., '75, $1.	..	18¾	18⅜	..	..			18½	..	17¼	..	17⅞	17½	600
Eureka G. Mg. G.	Cal'f		1,000,000	10,000	100		.....	2,094,000	May, '77, $2.	..	..	..	..	..			..	..	..	..	..	..	....
Exchequer, G. S.	Nev.	400	10,000,000	100,000	100	280,000	Sept., '76, $1.	....	.....	..	3½	..	2½	2¼			..	..	..	..	..	..	500
Gould and Curry, G. S.	Nev.	621	10,800,000	108,000	100	2,242,000	April, '77, $1.	3,934,800	Oct., '70, $10.	..	6¾	..	5¾	..			4½	..	4¾	..	4¾	4½	1,200
Granville Gold	N. C.	9,000	1,000,000	100,000	10	.....	.....	....	.....	..	2¼	..	..	..			2½	..	1⅝	1½	2	1⅞	500
Hale & Norcross, G. S.	Nev.	400	11,200,000	112,000	100	2,410,000	April, '77, 50c.	1,598,000	April, '71, $1.	..	2½	..	2¼	2¼			..	..	6⅝	6½	7	6¾	2,300
Henry Tunnel	Nev.	3,000	2,000,000	80,000	25	**	.....	....	.....	..	..	..	7¾	7			4⅝	4⅜	4	..	4⅜	4	2,800
Hukill, G. S.	Colo.	3,288	1,000,000	100,000	10	**	.....	40,000	May, '77, 10c.	12	..	..	4⅝	4			..	..	..	..	..	..	1,600
Indian Queen, S.	Nev.	1,000	3,000,000	60,000	50	....	.....	60,000	.....	..	..	..	..	..			..	..	..	..	..	..	....
Julia Cons., G. S.	Nev.	3,000	11,000,000	110,000	100	330,000	April, '77, $1.	....	.....	..	1⅞	..	1⅛	..			..	..	4¾	4½	..	..	500
Justice, G. S.	Nev.	2,100	10,500,000	105,000	100	1,502,500	Sept., '76, $5.	....	.....	..	..	..	..	..			..	..	..	..	3	2¾	900
Kentuck, G. S.	Nev.	95	3,000,000	30,000	100	270,000	Dec., '74, $1.	1,252,000	March, '70, $5.	..	..	..	3½	..			..	..	..	..	..	..	500
Kossuth, G. S.	Nev.	2,700	5,400,000	108,000	50	405,000	Aug., '76, 50c.	....	....	..	..	..	..	..			..	..	..	..	..	..	....
Lacross	Colo.	3,900	1,000,000	100,000	10	**	.....	....	.....	..	40c	37c	40c	37c			..	..	..	..	..	..	6,700
Leopard, L. G. S.	Nev.	1,500	5,000,000	50,000	100	50,000	March, '76, $1.	162,500	Dec., '76, 50c.	..	..	..	1¼	..			..	..	1⅛	1	1¼	1⅛	1,037
Lucerne Mining	Colo.	4,200	5,000,000	500,000	10	**	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Mariposa, preferred	Cal.	44,387	5,000,000	50,000	100	1,350,000	Feb., '77, $1.	....	.....	..	5¾	5	..	..			..	..	..	..	..	..	200
" common	"	acres.	10,000,000	100,000	100	1,350,000	Feb., '77, $1.	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Mer. & Min. Tun.	Colo.	30,000	500,000	50,000	10	**	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Merrimac, S.	Mass.	1,500	500,000	50,000	10	**	.....	60,000	May, '77, 10c.	12	7½	..	7⅜	..			7¼	7⅛	7⅜	7¼	7¼	..	1,800
Mexican, G. S.	Nev.	600	10,080,000	100,800	100	100,800	Sept., '76, 50c.	....	....	..	7¾	..	7⅛	..			..	..	..	..	5⅜	..	600
Morning Star	Nev.	1,600	8,000,000	80,000	100	....	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
N. Y. & Colo., G.	Colo.		1,000,000	50,000	20	**	.....	20,000	March. 17, 20c.	..	..	..	..	..			..	..	15½	15¼	15½	15¾	....
Northern Belle, S.	Nev.	1,600	5,000,000	50,000	100	.....	.....	1,150,000	April, '77, $1.	12	16½	16¼	17	..			..	..	9½	..	9¾	9¼	1,000
Ophir, G. S.	Nev.	675	10,080,000	100,800	100	2,034,400	May, '75, $2.	1,394,400	March, '64, $4.	..	15	..	..	..			11	..	..	..	..	..	900
Original Comstock, G. S.	Nev.	....	10,000,000	10,000	100	....	.....	....	.....	..	..	..	..	..			..	..	8	..	8	7¾	....
Overman, G. S.	Nev.	1,200	3,840,000	38,400	100	2,337,480	April, '77, $3.	....	.....	..	14½	14¼	..	..			..	..	..	..	..	..	1,000
Pleasant View, G.	Colo.	1,200	200,000	20,000	10	**	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	1,800
Quicksil. preferred	Cal.	8,500	4,291,300	100,000	100	**	.....	....	.....	..	22	..	..	..			22	..	22½	22	23⅛	23¼	1,050
" common	"	acres.	5,708,700	"	100	....	.....	....	.....	..	15½	14½	14¾	..			15	..	15	14⅜	..	15	850
Raymond and Ely, G. S.	Nev.	5,000	3,000,000	30,000	100	540,000	Dec., '76, $1.	3,075,000	Sept., '73, $3.	..	..	..	4	3½			3¾	..	..	..	3½	3¾	600
St. Joseph, L.	Mo.	2600 acs.	1,000,000	100,000	10	....	.....	250,000	1	..	5½	..	5⅝	..			5	..	..	..	..	..	....
Santiago, G. S.	Nev.	2,000	11,200,000	112,000	100	....	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Savage, G. S.	Nev.	800	11,200,000	112,000	100	3,082,500	Mch., '77, $1.	4,460,000	June, '69, $3.	..	..	..	..	..			..	..	..	..	..	..	....
Seaton, G. S.	Colo.	1,700	500,000	50,000	10	**	.....	10,000	May, '77, 10c.	12	4⅝	4½	4¾	4⅝			4⅝	3	3½	2½	3⅛	2⅜	9,400
Sez Belcher, G. S.	Nev.	160	640,000	6,400	100	244,800	April, '76, $5.	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Sierra Nevada G. S.	Nev.	3,650	10,000,000	100,000	100	1,650,000	April, '77, 50c.	102,500	Jan., '71, $1.	..	..	..	..	..			..	..	..	..	..	..	....
Silver City, G. S.	Nev.	3,900	6,310,000	63,100	100	15,775	Nov., '76, 25c.	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Silver Hill, G. S.	Nev.	5,400	5,400,000	54,000	100	918,000	April, '77, $1.	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
South Comstock, G. S.	Nev.	1,500	10,000,000	100,000	100	54,000	Jan., '77, 25c.	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
South. California, G. S.	Nev.	1,500	5,000,000	50,000	100	....	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Southern Star, G. S.	Nev.	1,500	6,000,000	600,000	100	....	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Trenton, G. S.	Nev.	..	10,000,000	100,000	100	....	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Union Cons., G. S.	Nev.	850	10,000,000	100,000	100	260,000	March, '76, $1.	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
West Belcher, G. S.	Nev.	1,000	10,000,000	100,000	100	....	.....	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Yellow Jacket, G. S.	Nev.	1,200	12,000,000	120,000	100	2,838,000	March, '77, $1.	2,184,000	Aug., '71, $2.50.	..	..	..	..	..			..	..	..	..	4½	..	100
Young America, S.	Nev.	1,000	3,000,000	30,000	100	6,000	Oct., '76, 20c.	....	.....	..	..	..	..	..			..	..	..	..	..	..	....
Boston Stocks.																							
											May 4.		May 5.		May 7.		May 8.		May 9.		May 10		
Allouez, c.	Mich.	..	1,000,000	20,000	50	940,000	May, '76, $5.	....	.....	..	6	75	7		7	25	7	75	7	50	7	25	....
Calumet & Hecla, c.	Mich.	..	2,000,000	80,000	25	1,200,000	**	11,450,000	Feb., '77, $5.	20	181	25	181	00	181	00	180	75	179	50	180	00	....
Central, c.	Mich.	..	500,000	20,000	25	100,000	June, '62, 65c.	1,160,000	Feb., '77, $7.	28	37	50	38	00	37	75	37	50	38	00	37	50	....
Copper Falls, c.	Mich.	..	1,000,000	20,000	50	535,000	May, '76,	100,000	Nov., '71, $1.	..	2	25	2	12½	2		2	12½	2	12½	2	00	....
Dana, c.	Mich.	..	500,000	20,000	25	68,000	Jan., '73, 50c.	....	.....	..	7		7		7		7		7		7		....
Dawson, s.	Ont.	..	1,200,000	60,000	20	....	.....	....	.....	..	12		11		10		11		11		11		....
Duncan, s.	Ont.	..	1,200,000	60,000	20	75,000	July, '76, 41 2-3.	....	.....	..	4	25	3	50	3	62½	3	50	2	75	2	62½	....
Franklin, c.	Mich.	..	500,000	20,000	25	360,000	June, '76, $5.	585,000	Nov., '71, $1	..	11	75	11	62½	11	50	11	25	11	00	11	00	....
Humboldt, c.	Mich.	..	500,000	20,000	25	100,000	Sept., '76, 15c.	....	.....	..	20		20		20		20		20		20		....
International, s.	Ont.	..	1,200,000	60,000	20	....	.....	....	.....	..	40		40		39		38		37½		25		....
Madison, c.	Mich.	..	500,000	20,000	25	123,000	Sept., '76, 10c.	....	.....	..	20		22		22		20		20		20		....
Mesnard, c.	Mich.	..	500,000	20,000	25	160,000	April, '76, 50c.	....	.....	..	80		75		75		70		70		70		....
Minnesota, c.	Mich.	..	1,000,000	20,000	50	436,000	June, '76, $1.	1,820,000	March, '73, 50c.	..	1	20	1	25	1	20	1	20	1	25	1	20	....
National, c.	Mich.	..	500,000	20,000	25	195,000	Oct., '75, $1.	360,000	Oct., '73, $1.	..	50		50		45		40		37½		40		....
Osceola, c.	Mich.	..	1,000,000	40,000	25	880,000	May 1, '76, $2.	....	.....	..	23	00	22	75	22	50	22	75	22	50	21	50	....
Petherick, c.	Mich.	..	500,000	20,000	25	165,533	March, '76, 50c.	....	.....	..	18		17		18		18		17		17		....
Pewabic, c.	Mich.	..	500,000	20,000	25	185,000	June, '68, $3.	460,000	July, '73, $1.	..	2	50	2	43¾	2	50	2	43¾	2	50	2	37½	....
Phœnix, c.	Mich.	..	1,000,000	20,000	50	817,500	Sept., '70, $3.	20,000	Jan., '76, $1.	..	....		....		....		....		....		....		....
Quincy, c.	Mich.	..	200,000	20,000	10	....	.....	2,130,000	Feb., '77, $4.	..	39	75	40	00	40	00	39	75	39	50	39	50	....
Ridge, c.	Mich.	..	500,000	20,000	25	200,000	.....	90,000	Feb., '75, $1.	..	3	37½	3	50	3	62½	3	75	4	00	4	00	....
Rockland, c.	Mich.	..	500,000	20,000	25	495,000	Jan., '74, $1.	....	....	..		20		20		20		20		20		20	....
Star, c.	Mich.	..	500,000	20,000	25	265,000	March, '76, 50c.	....	.....	..		18		17		18		17		17		18	....
Superior, c.	Mich.	..	500,000	20,000	25	340,000	March, '74, 25c.	....	.....	..		10		9		8		8		8		8	....

BOARD ADJOURNED.

G. Gold. S. Silver. L. Lead. C. Copper. ** Non-Assessable.

Total Assessments levied to date $40,646,128
Total Dividends disbursed to date 110,205,400

Total Sales of Coal Stocks for the week ..... 306,889 shares.
Total Sales of Mining Shares for the week ..... 58,512 "

ASSAY DEPARTMENT OF THE ENGINEERING AND MINING JOURNAL.

This department is opened for the purpose of affording to miners and prospectors the means of ascertaining the general character and approximate value of minerals found, and, when so desired, the actual value of the ore will be determined by careful assay or analysis.

Replies will be made in the columns of the ENGINEERING AND MINING JOURNAL to questions asked regarding the nature and the commercial value of minerals and of samples sent. The results of assays will also be published in these columns, except when otherwise requested.

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Assay for Gold	$2 00
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" Lead	1 50
" Zinc	2 00
Control Assays	3 00
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OR

Western Office,
ENGINEERING AND MINING JOURNAL,
Denver, Colorado.

ANSWERS.

Denver Office:

SAMPLES.

1. J. P. H., Salem, Mass.—Constituents galena, gray copper, and a small quantity of iron pyrites. The whole in a quartz gangue. The opaque white crystals associated with the quartz are calcspar (carbonate of lime). Carries silver and probably a trace of gold.

2. O. H. H., Alma, Colo.—From Indiana Gulch, near Breckinridge. The nugget is native bismuth; gives distinct reaction for tellurium.

3. A. L. M., Boulder, Colo.—Decomposed feldspathic granite, with quartz crystals interspersed. The black specks visible throughout are sulphides of silver. The ore is probably very rich. Could not be melted free.

4. H. EPPSTEIN, Alta, Utah.—The ore appears to be almost wholly oxide of iron. There is some carbonate of lead. Silver 26 ounces per ton.

5. A. N. ALLEN, Canon City, Colo.—Mica. The mineral is clear, and the beautiful violet shade is something very uncommon. Specimen sent too small for any practical purpose, except to be ground up for a lubricator or for similar uses. If you have large sheets, say 5 to 6 inches square, it will be very valuable. It will carry no silver or gold.

6. N. FAYUSSEN, Helena, Montana.—Light ruby silver associated with galena and zinc blende. Ore probably very rich. If you can send a good crystal, say ¼ to ½ inch in length or over, would be willing to pay for it.

7. H. F. OETRLING, Austin, Texas.—The mineral is oxide of manganese, and probably is barren of silver or gold. The sample is pure and good.

8. A. R. R., Lamie, Wyoming.—An impure graphite. Contains too much silica or sand to be of any value. Perhaps the deposit will show better material if opened more. By all means, take it up and explore it.

9. HENRY CARTWRIGHT, Silver City, N. M.—Limestone, showing no traces of silver or gold.

ASSAYS.

10. J. R., Colorado Springs.—Gold 5 oz., silver 8 oz.

11. J. ELLINGWOOD, Salt Lake.—Silver 350 oz., lead 8 per cent.

12. F. W. FOREMAN, Salt Lake.—Silver 116½ oz., lead 43 per cent.

F. W. FOREMAN, Salt Lake.—Silver 73 oz., zinc 12 per cent.

13. A. ATWOOD, Black-Hawk.—Gold 3¼ oz., copper 6½ per cent. Sample gives reaction for nickel.

14. J. G. ROLLER, Lake City.—Silver 1,648 oz.

15. F. H., Denver.—No. 2 gold —, silver —; No. 3 gold —, silver 5 oz.

16. C. W. E., Caribou.—Gold —, silver 4 oz.

17. E. EDWARD, Georgetown.—Silver 963 oz.

18. R. W. M., Georgetown.—Silver 345½ oz., lead 26 per cent.

19. F. H. HALSEY, Georgia.—Gold 2½ oz. This sample gives reaction for tellurium, and carries altaite (telluride of lead).

20. J. H. FOLEY, Alma, Colo.—Silver 22,648 oz. The mineral is silver glance, slightly mixed with quartz.

SAMPLES.

21. We acknowledge receipt of a set of characteristic specimens from the Clinton, Shoo-Fly, Virginia, and Murphy lodes, Alpine, Colorado.

The sample from the Murphy showed copper-glance, blue and green carbonates of copper, and a little galena. Interspersed were specks of silver sulphurets. The Virginia ore showed galena, pyrite, and a few traces of gray copper. The Shoo-Fly and Clinton samples were quite similar in appearance, consisting mainly of galena. In the Shoo-Fly there appeared some gray copper.

22. J. L. MCKINNIE, Moline, Ill.—Two samples from the McKinnie and Boomerang lodes, San Juan. Each contained galena and pyrites in a quartz gangue. In No. 2 there was a notable percentage of gray copper. Assays below.

23. L. B., San Francisco.—Received two samples from Melone's Mine, Calaveras County, containing telluride ore. Also a very handsome piece of nearly pure sulphide of silver from the Silver King Mine, Arizona. Many thanks. Have not yet tested the mineral for nickel, as you suggest.

24. A. R. R., Helena P. O., Colo.—Have tested the sample sent for tellurium but found none. The ore is mainly bright galena. Its conchoidal fracture gives the appearance of some of the tellurides. If you find anything more like the Boulder County tellurides would be glad to have samples to test. Sylvanite has a steel gray color, sometimes is yellowish. Has a conchoidal fracture. Altaite is tin-white and sectile, that is, you can cut it like lead.

25. ARTHUR O'BRIEN, Tintic, Utah.—The sample sent was almost pure calcite, containing no gold, silver, or lead. There were some few specks in it of the red oxide of copper. Such ore will do to throw over the dump. We acknowledge also the receipt of the elegant specimen of azurite. It is one of the finest we have ever seen.

26. F. H., Georgetown, Colo.—Sample is wholly of granite. The bright yellow specks which you found would not dissolve in acid are scales of gold mica, utterly worthless. The rock gave no hopes for assay, hence we made none.

ASSAYS.

27. J. L. MCKINNIE, Moline, Ill.—No. 1, 178 oz. silver; No. 2, 1,090 oz.

28. W. A. B., Santa Fe, N. M.—Silver 26 oz., gold 1 oz.

29. E. L. ALLEN, Georgetown.—Silver 301 oz., lead 12 per cent.

30. M. B. H., Georgetown.—Silver 1,192 oz.

31. R. ARCHER, Central.—Gold 4½ oz., silver 32 oz.

32. L. M. B., Central.—Copper 18½ per cent.

33. R. A. KALL, Deadwood.—Gold 3¾ oz.

34. B. M. LIGHTALL, Deadwood.—Gold 1 oz., silver 46½ oz.

35. H. R. CREARY, Columbus, Ohio.—Gold ½ oz.; silver 634 oz.; lead 14 per cent.; copper 8 per cent.; silica 30 per cent.; iron 2 per cent.; antimony ½ per cent. Balance is sulphur, potash, lime, and alumina.

Gas Stocks.

NEW YORK, FRIDAY EVENING, May 11, 1877.

The market for gas stocks is very dull and price generally tend lower. The quotations of the Mutua and New York, show a little improvement, with thes exceptions we lower a number of the quotations notably those of the Manhattan, which is down $5 pe share.

Philadelphia Gas Trust. The Common Council of Philadelphia have authorized the Gas Trust to erect 210 new lamps in different parts of the city.

The Citizens' Gas Company, of Troy, N. Y., propose reducing its capital stock $50,000.

The St. Louis Gas Company recently contracted with Messrs. Joseph Walton & Co., of Pittsburg, Pa., for 400,000 bushels of coal.

Boston Gas Company. We are reported small transactions in the stock of this company at from $820 to $822½ per share.

Cambridge, Mass., Gas Company. 25 shares of the stock of this company were sold at auction during the week, at $137 per share.

The New York Gas Company, has declared a dividend of 5 per cent.

The Metropolitan Gas Company, of Brooklyn, has declared a dividend of 2½ per cent., payable on the 20th inst.

Sioux City, Iowa, Street Lamp Expenditure. The City pays about $3,000 per year to the gas company for lighting its streets, the cost for lighting on April account amounting to $254.17.

Minersville, Pa., Gas Contract. At a meeting of the Common Council of this place, on the 3d inst., a contract was awarded to the Globe Gas Light Company for lighting the lamps of the place, for $24 per year each. About forty lamps will be required to thoroughly light the place.

The Kingston, N. Y., Gas Difficulty. The following resolutions were passed by the Common Council of this place, on the 4th inst:

Resolved, That, as the average rates for furnishing gas and lighting the lamps of the cities of Newburg, Poughkeepsie. and Hudson is 1 55-100 cents per hour, the Mayor and corporation counsel are hereby authorized and directed, if the Gas Light Company accept, to enter into a contract for furnishing the gas

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and lighting the street gas lamps of this city, upon the following terms and conditions; to wit: Twenty-two nights a month until 12 o'clock, with four-foot burners per hour, at an average of 5½ hours each night, or 121 hours each month, making 1,452 hours a year, at the rate of 1 55-100 cents per hour, or $22.50 per year for each lamp. And in case the Gas Light Company decline to enter into this agreement, that then the Mayor and corporation counsel shall close a contract with the most available bidder or bidders to light the street lamps with gasoline, in accordance with the specifications therefo

The following list of Companies in New York and vicinity are corrected weekly by GEORGE H. PRENTISS, Broker and Dealer in Gas Stocks, No. 30 Broad st., N. Y.

Companies in New York and vicinity.	Capital Stock.	Par.	Dividends. Rate per an.	Dividends. Am. of last.	Dividends. Date of last.	Quotat'ns. Bid.	Quotat'ns. As'd
	$						
Mutual, N. Y.....	5,000,000	$100	10%	2½	Apr. '77	90	94
" Gold Bonds	90,000	1,000	7%	3½	Feb. '77		107
N. York "	4,000,000	....	10%	5	Nov. '76	130	134*
Metrop. "	2,500,000	100	10%	5	Sep. '76	137	138
" " Certf.	1,000,000	....	7%	3½	" "	103	105
" " Bonds	500,000	1,000	7%	3½	Dec. "	102	—
Harlem "	1,850,000	50	8%	4	Feb. '77	104	—
Manhat. "	4,000,000	50	....‡	0	Dec. '76	205	210
Brooklyn, B'klyn.	2,000,000	52	15%	15	Nov. '76	—	172
Nassau, " ...	1,000,000	25	....‡	4	Jan. '76	82½	—
" " Certf.	700,000	1,000	7%	3½	Nov. '76	95	—
People's, " ...	1,000,000	10	....‡	3½	Jan. '76	—	51
" " Certf.	300,000	1,000	7%	3½	July '76	84	90
" " B'ds	325,000	....	7%	3	Feb. '77	90	96
Metrop. "	1,000,000	10	5%	3½	Nov. '76	75	77½
Wmsb'rg "	1,000,000	50	10%	3	Oct. '76	130	135
" " Certf.	1,000,000	...	7%	3½	July "	100	102
Citizen's "	1,200,000	20	....‡	2½	Jan. '76	90	97
" " Certf.	320.000	1,000	7%	3½	Oct. "	98	102
J. C., N. J.....	750,000	20	10%	5	July '75	160	—
Cent. Westch. N.Y	466,000	50	7%	4	July "	85	90
Subur'n " "	295,000	50	7%	3½	Oct 1'76	90	100

‡Paid irregularly.
* Ex-Dividend of 5 per cent.

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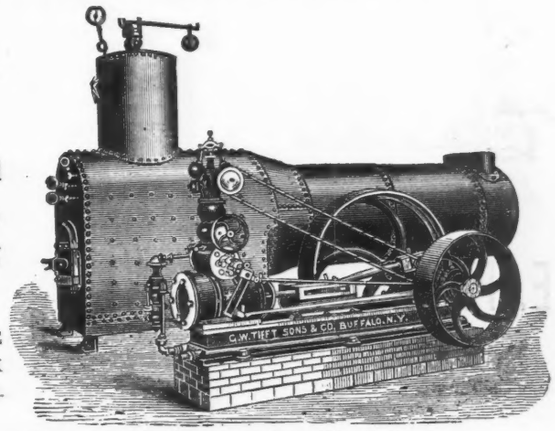

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1⅜	4⅜	2⅜	5	.11	⅜	¾	1¼	1	20	125.00
2	5	3	7	.25	¾	1	1½	1¼	30	175.00
3	6	3⅜	7	.29	1	1¼	2	1½	40	215.00
3⅜	7	4	7	.38	1	1¼	2½	2	60	260.00
4	8	4⅜	10	.68	1¼	1½	3	2½	90	350.00
4⅜	8	5	10	.85	1¼	1½	3	2½	125	370.00
5	10	6	10	1.21	1¼	1½	3½	3	150	420.00
5⅜	10	7	10	1.66	1¼	1½	4	4	200	450.00
6	12	7	10	1.66	1½	2	4	4	200	500.00

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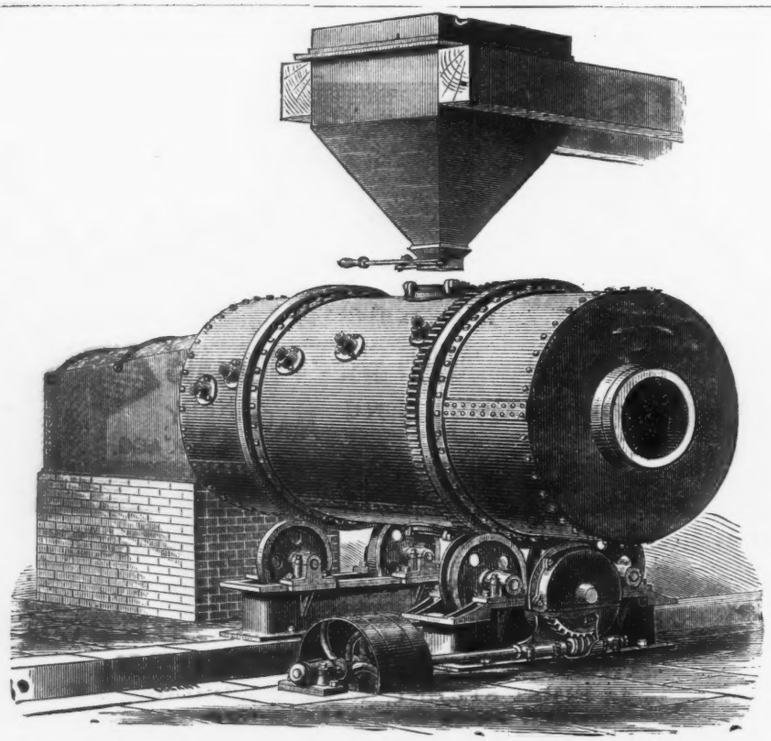

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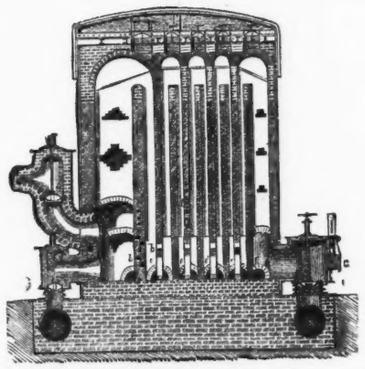

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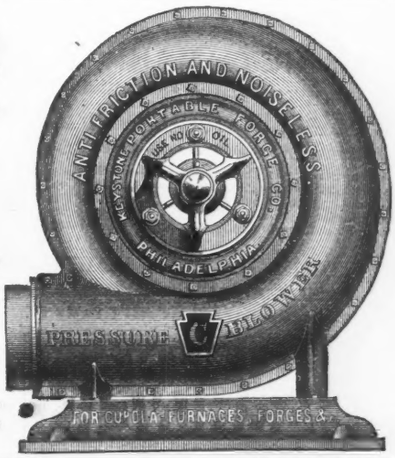

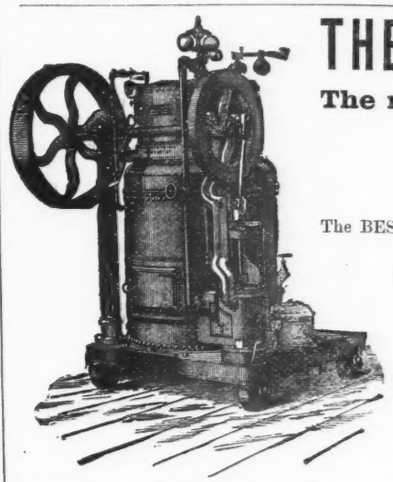

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